Vol. 889 Number 2

OFFICIAL GAZETTE

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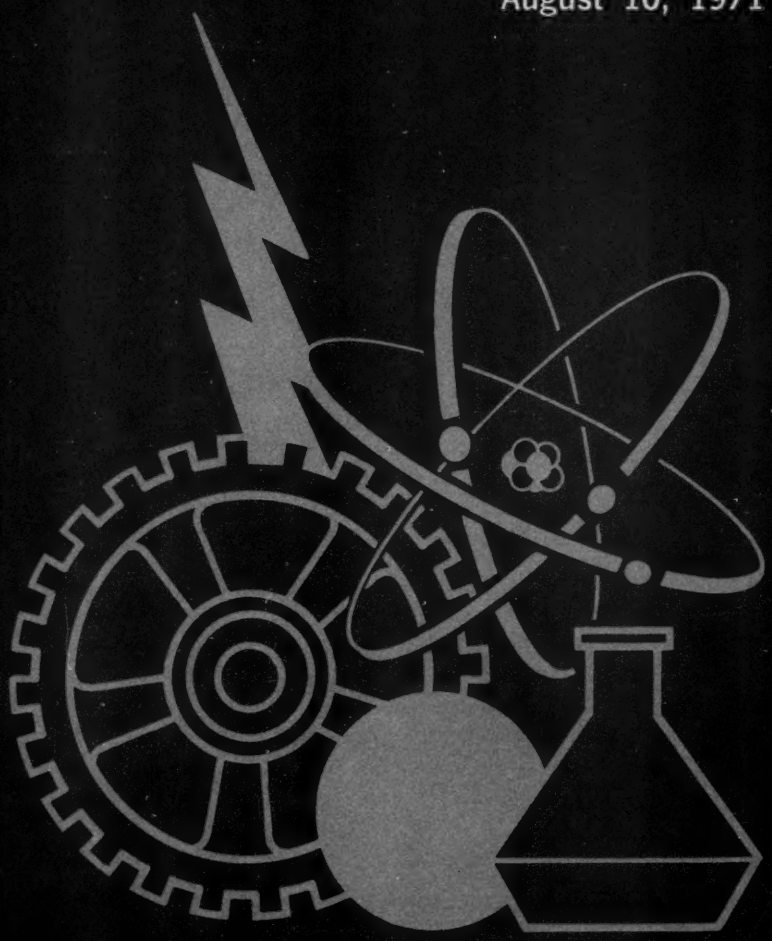
PATENTS

August 10, 1971



U. S. DEPARTMENT OF COMMERCE
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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

August 10, 1971 Volume 889 Number 2

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PATENT OFFICE NOTICES

Printing of Chemical Patents

In view of financial and scheduling considerations associated with the closing of Fiscal Year 1971, no chemical patents will appear in the patent issues of August 24 and 31, and September 7 and 14, 1971. Chemical patents will again be issued on September 21, 1971.

RICHARD A. WAHL,
July 6, 1971. *Acting Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,803,657, L. Ritter, ACID STABILIZED TETRACYCLINE SALTS; **3,128,227,** Kanegis and Ritter, ANTIBIOTIC INTRAMUSCULAR COMPOSITION, **filed** Jan. 29, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-242-JWC, *American Cyanamid Company* v. *Rachelle Laboratories, Inc.*

2,869,120, Lolmaugh, Thornton and Smith, TOW TARGET HAVING COMBUSTION SIGNAL MEANS, **filed** Jan. 28, 1971, U.S. Ct. of Cl., Washington, D.C., Doc. 27-71, *Del Mar Engineering Laboratories* v. *The United States of America.*

3,011,608. (See 3,429,410.)

3,025,778, L. J. Stuckens, PHOTOCOPY APPARATUS AND DOCUMENT CARRIER FOR SAME, **filed** Mar. 9, 1971, D.C. Mass. (Boston), Doc. C.A. 71-544-C, *Robert R. Russo, doing business as General Graphic* v. *American Photocopy Equipment Company.*

3,050,087, D. M. Caplan, FLEXIBLE HOSE; **3,194,705,** same, METHOD AND APPARATUS FOR MAKING REINFORCED CORRUGATED HOSE, **filed** Nov. 13, 1965, U.S. Ct. of App., 6th Cir., Cincinnati, Ohio, Doc. 19911, *H. K. Porter Company, Inc.* v. *The Goodyear Tire & Rubber Company.* Lower Court affirmed and remanded, decided Jan. 27, 1971.

3,122,395, E. Offner, WIDTH-ADJUSTING ATTACHMENT FOR WHEEL CHAIRS, **filed** Feb. 15, 1971, D.C.N.J. (Newark), Doc. C 204-71, *Narro-Matic, Inc.* v. *Everest & Jennings, Inc.*

3,128,227. (See 2,803,657.)

3,194,705. (See 3,050,087.)

3,228,053, Horton, Berry and Stirling, CYLINDRICAL BRUSH ASSEMBLY, **filed** Feb. 26, 1971, U.S. Ct. of Cl., Washington, D.C., Doc. 61-71, *Newark Brush Company et al.* v. *The United States of America.*

3,302,731, J. W. Perry, POST DRIVING AND COMPACTING MACHINE; **3,335,804,** same, POST DRIVING MACHINE, **filed** Feb. 31, 1971, D.C. Ariz. (Phoenix), Doc. C-71-75 Phx., *James W. Perry et ux.* v. *Goettl Bros., Metal Products, Inc.*

3,335,804. (See 3,302,731.)

3,359,351, R. B. Bender, METHOD OF APPLYING INSULATION COATING FOR PIPE; **3,432,582,** same, APPARATUS AND METHOD FOR COATING PIPE. **filed** Oct. 30, 1969, D.C., S.D. Tex. (Houston), Doc. 69-H-1062, *Richard B. Bender and Thermacor Process, Inc.* v. *Polymer Insulations, Inc.* Judgment entered, patents valid and infringed; injunction issued, Jan. 28, 1971.

3,363,591, R. E. Lawrence, SECTIONALIZED EXPANSIBLE INSULATED SMOKESTACK AND BREECHING; **3,368,506,** same, STACK SECTIONS WITH EXPANSION MEANS; **3,487,795,** same, SECTIONALIZED EXPANSIBLE SMOKESTACK, **filed** Feb. 8, 1971, D.C. Mass. (Boston), Doc. 71-374-M, *Lawrence Rigging, Inc. et al.* v. *Airtek Corporation et al.*

3,368,506. (See 3,363,591.)

3,368,811, B. B. Finney, INTERLOCKING GLOVE AND HANDLE, **filed** Jan. 29, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-240-CC and Doc. 71-241-CC, *Basil B. Finney* v. *National Aeronautics and Space Administration.*

3,390,893, O. F. MacLaren, STRUCTURES FOR FOLDING BABY-CARRIAGES, CHAIRS AND THE LIKE, **filed** Dec. 7, 1970, D.C., S.D.N.Y., Doc. 70-C-5348, *Owen Finlay MacLaren and Miron Charles Bell* v. *B-I-W Group Inc.*

3,394,729, Bower, Wykes and Bonds, CONTROL SYSTEM FOR SELF-PROPELLED SPRINKLING APPARATUS, **filed** Feb. 16, 1970, D.C., N.D. Tex. (Lubbock), Doc. CA-5-787, *Layne & Bowler Pump Company* v. *Gifford-Hill Western Inc.* Judgment in favor of plaintiff; plaintiff is the sole and exclusive owner of said patent.

3,395,364, W. B. Bridges, IONIZED NOBLE GAS LASER, **filed** Feb. 16, 1971, D.C., N.D. Calif. (San Francisco), Doc. C-71-290 LHB, *Hughes Aircraft Corp.* v. *Coherent Radiation, Inc.*

3,407,552, P. G. Cassidy, BASEMENT WATERPROOFING METHOD AND ARRANGEMENT, **filed** Feb. 12, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c409, *Paul G. Cassidy and Paul G. Cassidy & Co.* v. *John R. Sukach, Aqua Waterproofing Co.*

3,408,523, Demarest and Karlson, LIGHT BULB WITH A PLURALITY OF INDEPENDENTLY CONNECTED FILAMENTS FOR INDICATING GRAPHIC SYMBOLS, **filed** May 1, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1044, *Refac Technology Development Corp.* v. *General Instrument Corp.* Stipulation dismissing cause with prejudice, Mar. 5, 1971.

3,418,106, J. A. Pierret, REFRACTORY METAL POWDER; **3,473,915,** same, METHOD OF MAKING TANTALUM METAL POWDER, **filed** Jan. 20, 1971, D.C., E.D. Pa. (Philadelphia), Doc. CA-71-152, *Kawecki Berylco Industries, Inc.* v. *Fansteel, Inc.*

3,429,410, Q. A. Hansen, CLUTCH WITH NON-ROTATABLE FLUID MOTOR; **3,011,608,** same, FLUID PRESSURE OPERATED CLUTCH HAVING AN INTEGRAL AND NON-ROTATABLE CYLINDER AND PISTON ASSEMBLY, **filed** Dec. 24, 1969, D.C., E.D. Wis. (Milwaukee), Doc. 69-C-631, *Formsprag Company* v. *Cabat Engineering Corporation.* Final judgment entered dismissing complaint and counterclaim with prejudice, Nov. 30, 1970.

3,432,582. (See 3,359,351.)

3,436,787, W. H. Wisdom, STEAM AND VACUUM NOZZLE; **3,439,374,** same, **filed** Feb. 9, 1971, D.C., S.D. Fla. (Miami), Doc. 71-206-C-JLK, *Steamatic, Inc. etc.* v. *Edward H. Crane and Steam-O-Vac, Inc., etc.*

3,439,374. (See 3,436,787.)

3,473,915. (See 3,418,106.)

3,476,260, R. S. Jay, STORAGE RACK FOR CYLINDRICAL CONTAINERS, **filed** Dec. 22, 1970, D.C., E.D. Wis. (Milwaukee), Doc. 70-C-723, *Jarke Corporation* v. *C & H Distributors, Inc.* Consent decree, action dismissed, Mar. 8, 1971.

3,486,919, Dreazy and Kreeger, PANEL EMBOSSING AND PRINTING PROCESS, **filed** Jan. 26, 1971, D.C. Oreg. (Portland), Doc. C-71-47, *Evans Products Company* v. *Hearin Products, Inc.*

3,487,795. (See 3,363,591.)

3,493,209, R. C. Brammer, STABILIZING JACK BASE, **filed** Feb. 11, 1971, D.C., W.D. Mich. (Kalamazoo), Doc. CA 309, *Stromberg Carlson Products, Inc.* v. *Barker Mfg. Co.*

Re. 26,368, H. B. Brose, TIRE REPAIR INSERT, **filed** July 22, 1968, D.C., S.D. Fla. (Miami), Doc. 68-860-C-CA, *Horace B. Brose* v. *Sears, Roebuck and Co. et al.* Final judgment, none of claims 1, 11, 14 and 16 is infringed. The defendants, their attorneys and agents, and National Distillers and Chemical Corporation and its H. B. Egan Mfg. Co. Div., their attorneys and agents, are required to return to C. V. Wisner, Jr., counsel for plaintiff, within sixty days after entry of this final judgment, all copies of documents received by them during the discovery process which passed between plaintiff and his attorneys after Jan. 22, 1962, and each of them shall refrain from publishing in any manner and of the contents thereto. The clerk of the court shall return to C. V. Wisner, Jr. the documents identified in Finding No. 45 of the findings of fact and conclusions of law filed herein Jan. 7, 1971; Feb. 27, 1971.

D. 191,144, G. Schanz, COMBINATION STORING AND STACKING CASE, filed Feb. 26, 1967, D.C., E.D.N.Y. (Brooklyn), Doc. 67-C-62, *G. B. Lewis Co.* v. *Continental Dynamics Corp. and Global Equipment Co.* Order of discontinuance, Feb. 24, 1971.

D. 212,864, R. Fraige, LENS FOR SPECTACLES, filed Sept. 18, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2301, *C & F Products of San Francisco, Inc.* v. *Popular Products Manufacturing Company et al.* Consent judgment, plaintiff owner of Design Patent No. 212,864. Defendants will not hereafter use the trademark in Reg. No. 875,547 nor commit any acts of infringement of such registration.

D. 217,981, F. H. Panning, WASTE RECEPTACLE OR THE LIKE, filed Feb. 5, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-304-WPG, *Floyd H. Panning, etc.* v. *Eleanor V. Kingsley, etc.*

Certificates of Correction for the Week of Aug. 10, 1971

Re. 27,064	3,546,117	3,561,351	3,570,630
Re. 27,084	3,546,185	3,562,103	3,570,777
D. 207,096	3,546,204	3,562,428	3,570,788
D. 220,376	3,546,659	3,562,636	3,571,637
3,334,174	3,548,192	3,563,286	3,571,874
3,392,704	3,549,430	3,563,635	3,572,118
3,394,465	3,549,480	3,563,974	3,572,164
3,423,623	3,550,826	3,564,093	3,573,032
3,450,335	3,551,098	3,564,264	3,573,238
3,459,269	3,551,737	3,564,473	3,573,462
3,488,728	3,551,829	3,564,509	3,573,663
3,498,304	3,552,664	3,565,625	3,574,073
3,507,834	3,552,975	3,565,726	3,574,240
3,513,265	3,554,378	3,565,942	3,574,284
3,513,303	3,555,118	3,565,977	3,574,329
3,521,144	3,555,385	3,566,018	3,574,844
3,528,939	3,555,976	3,566,743	3,574,916
3,532,800	3,556,197	3,566,800	3,574,944
3,537,075	3,556,986	3,566,990	3,575,055
3,537,084	3,557,016	3,567,510	3,575,204
3,538,618	3,558,145	3,567,973	3,575,293
3,538,758	3,558,508	3,567,990	3,575,398
3,539,122	3,558,633	3,568,051	3,575,418
3,539,161	3,558,830	3,568,660	3,575,772
3,541,056	3,559,712	3,568,718	3,576,122
3,541,775	3,560,375	3,568,967	3,576,251
3,541,915	3,560,752	3,569,779	3,576,762
3,545,233	3,560,827	3,569,995	3,577,059
3,545,701	3,560,973	3,570,181	3,577,387
3,545,720	3,561,040	3,570,490	3,577,856

Adverse Decisions in Interferences

In the designated interferences involved the indicated claims of the following patents final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,377,240, J. D. Nault, NEMATOCIDAL 4-HALOPYRIDINES, THEIR OXIDES AND HYDROHALIDES, decided June 30, 1971, Interference No. 96,930, claims 1, 2, 3, 4 and 5.

Patent No. 3,378,582, W. A. Bolhofer, (α-PHENOXY)- AND (α-PHENYLTHIO)-OMEGA-PHENYL-ALKANOIC ACIDS, decided June 30, 1971, Interference No. 96,998, claims 1 and 2.

Patent No. 3,431,942, A. F. Kopaska, HYDRAULIC COUPLER, decided June 30, 1971, Interference No. 97,318, claims 1, 2 and 4, 5, 6, 7 and 8.

Patent No. 3,490,119, Y. Fukuyama and Y. Okada, POLYURETHANE RUBBER COVERED ROLL, decided June 30, 1971, Interference No. 97,504, claim 1.

Patents Available for Licensing or Sale

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,358,532. ADJUSTABLE OPEN-END WRENCH. Robert Allred, 2850 Laskey Road, Toledo, Ohio, 43613.

3,532,645. INSECT REPELLENT DEVICE. Earl N. BEAUCHAMP, 7213 S. Sawyer Ave., Chicago, Ill., 60629.

3,576,644. DRY ALCOHOLIC BEVERAGE FORMING COMPOUND. Anderson et al. Correspondence to: The Signal Companies, Inc., 1010 Wilshire Blvd., Los Angeles, Calif., 90017.

3,581,626. ADJUSTABLE ADMISSION VALVE MEANS FOR STEAM ENGINES AND THE LIKE. Daniel S. Matthews, 513 Ford Road, Sacramento, Calif., 95638.

3,582,441. DECORATIVE TRIM FOR WINDOW SHADES. Samuel Guffan. Correspondence to: Jacobs & Jacobs, 521 5th Ave., New York, N.Y., 10017.

3,582,583. CODED SWITCH. Stephen Paterson, 4 Dartmouth St., Forest Hills, N.Y., 11375.

3,583,176. POWER OPERATED MEANS FOR PRODUCING FROZEN DESSERTS IN A REFRIGERATED COMPARTMENT. Cecil E. Gordy, 9324 Castlemont Circle, Orangevale, Calif., 95662.

3,585,564. SWIVELING ELECTRICAL CONNECTOR. Olav Skjervoll. Correspondence to: Jacobs & Jacobs, 521 5th Ave., New York, N.Y., 10017.

The following 2 patents are offered by Joe Bertao, with correspondence to: Loudres Bertao, % Joe Bertao, 7033 E. Harlan, Laton, Calif., 93242.

3,094,099. FLOATING CLAW FOR MILKING MACHINES.

3,408,878. TRANSMISSION.

The following 2 patents are offered by R. S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio, 44130.

3,309,884. DEWAR DESIGN.

3,412,573. CRYOGENIC QUICK FREEZER.

The following 2 patents are offered by Duane C. Bowen, 2541 State St., Carlsbad, Calif., 92008.

3,570,847. TIGHTWIRE SPORTS EQUIPMENT.

3,570,848. TIGHTWIRE.

The following 2 patents are offered by Th. Kieserling & Albrecht, Birkenweiher 66, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,570,290. STRAIGHTENING MACHINE FOR ROUND WORKPIECES.

3,570,300. APPARATUS FOR EJECTING ARTICLES IN COLD FORMING PRESSES OR THE LIKE.

Department of Health, Education and Welfare is prepared to grant licenses under the following 4 patents, as provided by Title 45 C.F.R. Section 6.3.

Inquiries should be addressed to: Mr. Norman J. Latker, Chief, Patent Branch, % National Institutes of Health, Room 5A03, Westwood Bldg., Bethesda, Md., 20014.

3,540,388. GASSIFICATION MATERIAL COMBUSTION METHOD AND APPARATUS.

3,578,839. AUTOMATED DEVICE FOR PROTECTING LENS SYSTEMS.

3,580,680: FLAME EMISSION INSTRUMENT FOR SELECTIVELY MONITORING METAL AEROSOLS.

3,584,001. CERTAIN N-SUBSTITUTED CYCLOBUTANE CARBOXAMIDES.

General Electric Company is prepared to grant non-exclusive licenses under the following 14 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,571,631. ELECTRICAL DISCHARGE STABILIZER.

3,579,929. FLEXIBLE STRUCTURE ORIENTATION CONTROL.

Applications for license under the following 12 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

2,841,003. CONTROL CIRCUITS FOR AUTOMATIC CLOTHES WASHING MACHINES.

2,957,329. CONTROL CIRCUITS FOR AUTOMATIC CLOTHES WASHING MACHINES.

3,074,863. PROCESSES OF AND APPARATUS FOR TREATING IONIC LIQUIDS.

3,074,864. METHODS OF AND APPARATUS FOR DEMINERALIZING RAW WATER.

3,074,865. METHODS OF AND APPARATUS FOR DEMINERALIZING RAW WATER.

3,084,113. METHODS OF AND APPARATUS FOR DEMINERALIZING WATER.

3,450,021. AIR-CONDITIONER AIR FLOW CONTROL DEVICE.

3,531,947. REFRIGERATION SYSTEM INCLUDING REFRIGERANT NOISE SUPPRESSION.

3,569,670. SAFETY DOOR LATCHING SYSTEM FOR SELF-CLEANING OVEN HAVING HYDRAULIC THERMOSTAT WITH CAM-ACTUATED AUXILIARY SWITCH.

3,569,672. LOW THERMAL MASS, PLATE SURFACE HEATING UNIT.

3,571,564. MULTILEVEL TEMPERATURE CONTROL CIRCUIT.

3,572,978. HERMETIC COMPRESSOR HAVING LUBRICANT COOLING MEANS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 13, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-01-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-02-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-01-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	10-12-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-09-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-30-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	7-06-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	2-27-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-23-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-01-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	5-01-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-01-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	8-10-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	7-01-70

Expiration of patents: The patents within the range of numbers indicated below expire during July 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,682,658 to 2,685,084, inclusive
Plant Patents..... Numbers 1,288 to 1,293, inclusive

REISSUES

AUGUST 10, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,158
CROSSLINKING PROCESS

Clifton L. Kehr, Silver Spring, and James L. Guthrie, Ashton, Md., assignors to W. R. Grace & Co., New York, N.Y.

Original No. 3,226,356, dated Dec. 28, 1965, Ser. No. 232,771, Oct. 24, 1962. Application for reissue Nov. 28, 1969, Ser. No. 888,173

Int. Cl. C08d *11/00;* **C08f** *3/02, 45/08*

U.S. Cl. 260—41.5 **16 Claims**

The curing of alpha-olefins and of alpha-olefin copolymers with quinone dioxime esters is accelerated by the addition of a Lewis acid. The curing temperature is lowered still further by the addition to the curing system of a synergistic agent consisting of a polar organic member of the group consisting of carboxylic acids, phosphoric acid, boric acid, and esters thereof, and fillers such as carbon black and/or other conventional additives may be included.

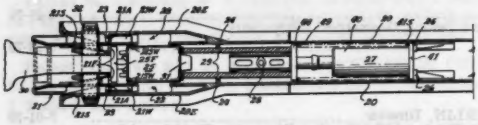
27,159
HYDRAULIC CUSHION

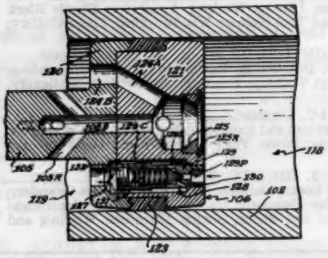
David S. Campbell, Glen Ellyn, and Eldred H. Natschke, Bourbonnais, Ill., assignors to Cardwell Westinghouse Company

Original No. 3,150,783, dated Sept. 29, 1964, Ser. No. 278,952, May 8, 1963, which is a continuation-in-part of Ser. No. 220,323, Aug. 29, 1962. Application for reissue Sept. 8, 1969, Ser. No. 862,990

Int. Cl. B61g *9/16, 11/12*

U.S. Cl. 213—43 **21 Claims**





A hydraulic cushion for railroad cars including a hydraulic cylinder having a ram actuated piston reciprocally mounted therein in which the piston is equipped with a variable orifice responsive to instantaneous pressures on the high pressure side of the piston in the form of a spring loaded orifice pin that meters the flow of hydraulic fluid between the high and low pressure sides of the piston in ccshioning impacts. A pressure relief valve is also included in the piston to protect against overloads.

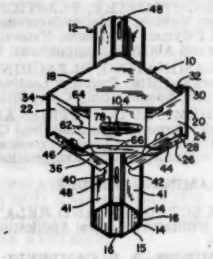
27,160
STEEL SHELVING

Irwin J. Ferdinand, Glencoe, and Milton E. Handler, Evanston, Ill., assignors to Hirsh Company

Original No. 3,479,975, dated Nov. 25, 1969, Ser. No. 668,433, Sept. 18, 1967. Application for reissue Jan. 19, 1970, Ser. No. 3,251

Int. Cl. A47b *95/08, 3/06*

U.S. Cl. 108—144 **17 Claims**



Knockdown lightweight steel shelving in which cut ends of corner notched shelf flanges are clamped securely against adjacent sides of a roll-formed upright corner post having improved form lines for continuous shelving with wedge activated tension elements manually applied from a position internally of the shelves.

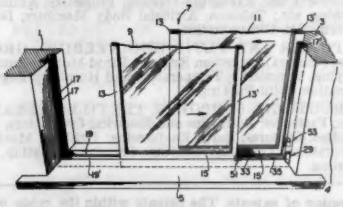
27,161
ADJUSTABLE CLOSURE LOCK

Raymond T. Raymon, Warren, Mich., assignor to Home Guard Control, Inc., Detroit, Mich.

Original No. 3,420,001, dated Jan. 7, 1969, Ser. No. 654,136, July 18, 1967. Application for reissue Dec. 22, 1969, Ser. No. 886,958

Int. Cl. E05d *13/04*

U.S. Cl. 49—449 **20 Claims**



A lock for use with sliding closure panels, and the like, to lockingly maintain a panel in adjusted partially open position, against further opening, or in fully closed position. A locking bar of adjustable length pivotally mounted at one end, and inoperative locking position disposed in the horizontal guide track for the panel, and extending therein in a plane parallel to the plane of slid-

ing movement of the panel, and in inoperative position disposed in the vertical channel guide track for the panel. The adjustable locking bar in operative position having the free end thereof engaged against the rear edge of the panel to prevent the panel from being moved rearwardly. Clamping means positioned in said vertical channel guide track for releasably maintaining said locking bar in inoperative position.

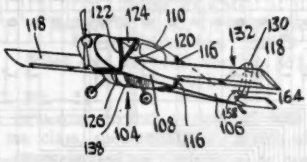
27,162
PARACHUTE PROTECTED AIRCRAFT

Odell C. Markham, 247 Colorado Ave., Bridgeport, Conn. 06605, and Alan C. Ferguson, Perry Ave., Norwalk, Conn. 06850

Original No. 3,395,881, dated Aug. 6, 1968, Ser. No. 616,672, Feb. 16, 1967. Application for reissue Sept. 24, 1968, Ser. No. 767,535

Int. Cl. B64d *25/00*

U.S. Cl. 244—139 **13 Claims**



A parachute-protected aircraft having a framework comprising fuselage and wings, and an outboard parachute anchored at a top portion of the framework adjacent the center of gravity of the aircraft. The parachute is secured to the aircraft by an anchorage or base member tethered to the parachute and overlying the framework and by attachable fastener devices engaging the base member and adapted to be secured to the framework.

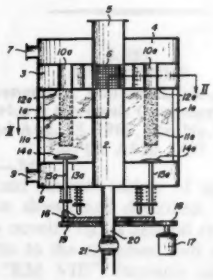
27,163
CONTINUOUSLY AND AUTOMATICALLY CLEANING MULTICELLULAR FILTERS

Jean-Jacques Asper, Geneva, Switzerland, assignor to Brasco S.A., Geneva, Switzerland

Original No. 3,392,835, dated July 16, 1968, Ser. No. 448,386, Apr. 15, 1965. Application for reissue May 13, 1969, Ser. No. 830,901

Int. Cl. B01d *29/38*

U.S. Cl. 210—138 **17 Claims**



A multicellular filter for liquids comprising several circularly arranged filter cells each enclosing at least one filter element carried at one end by a tubular member communicating with a common outlet chamber. Gauged annular passages surrounding each tubular member connect each cell with a common admission chamber. For cleaning, the cells communicate cyclically with a common discharge chamber via discharge channels each equipped with a valve having a brief maximal opening stage for sudden reverse filtrate flow followed by a longer partial opening stage for direct flow of liquid from the admission chamber to the discharge chamber.

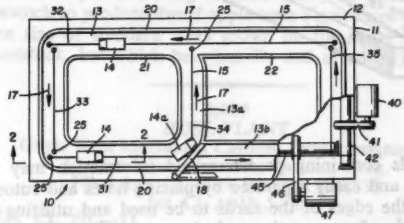
27,164
MINIATURE AUTOMOBILE RACING GAME UTILIZING ADHESIVE CONNECTION

Edward H. Yeager, Akron, Ohio, assignor to Mattel, Inc., Hawthorne, Calif.

Original No. 3,335,520, dated Aug. 15, 1967, Ser. No. 443,891, Mar. 30, 1965. Application for reissue Aug. 12, 1969, Ser. No. 860,446

Int. Cl. A63h *33/26*

U.S. Cl. 46—243M **5 Claims**



A toy auto track having a surface with series of motor driven belts arranged thereover in a closed path and toy autos for movement over said path. Adhesive means, such as tape, with a downwardly directed exposed adhesive surface is affixed to the underside of each auto in position to contact and adhere to the moving belt. Rails and/or pivoted members along the path guide the autos directionally.

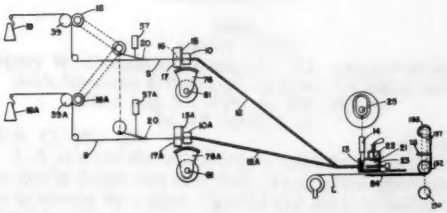
27,165
TUFTING APPARATUS FOR THE MANUFACTURE OF CARPETS, RUGS, AND THE LIKE

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540, and Loy E. Barton, Bradenton, Fla.; said Barton assignor to said Spanel

Original No. 3,387,577, dated June 11, 1968, Ser. No. 503,342, Oct. 23, 1965. Application for reissue Sept. 17, 1969, Ser. No. 866,416

Int. Cl. D05c *15/16*

U.S. Cl. 112—79 **38 Claims**



Yarn bits are cut from yarn strands and *pneumatically* transported [by suction] to bit-loading stations where they are positioned by stop means for transfer to a backing layer by bit-applying elements as provided by needles, narrow blunt-edged blades, or a single [wide] blunt-edged blade.

27,166

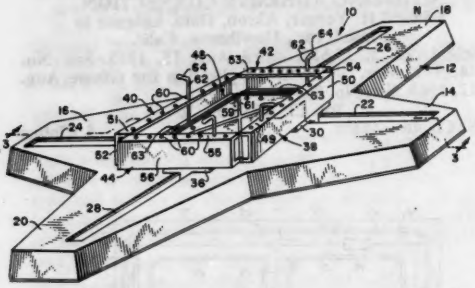
SELECTIVE CARD DISTRIBUTING DEVICE

Le Roi Nottoli, Chicago, Ill., assignor to Robert H. Hallowell Industries, Inc.

Original No. 3,377,070, dated Apr. 9, 1968, Ser. No. 496,618, Oct. 15, 1965. Application for reissue Oct. 13, 1969, Ser. No. 871,486

Int. Cl. A63f *1/14*

U.S. Cl. 273—149P 16 Claims



Cards containing predetermined information may be simply and easily separated by placing holes and cutouts along the edges of the cards to be used and utilizing as the means for separation a device comprising a base and a plurality of card carrying trays which are movable on the base, said trays having holes therethrough so that a pin or series of pins which are adapted to be removably placed through a hole in each of said trays will pass through a preselected series of holes and cutouts and movement of the trays outward will result in extraction of certain cards in one or more directions thereby effecting separation. The cards and device described herein are especially suitable for use with playing cards whereby a pack of playing cards having the holes and cutouts above described may be separated into four preselected hands.

27,167

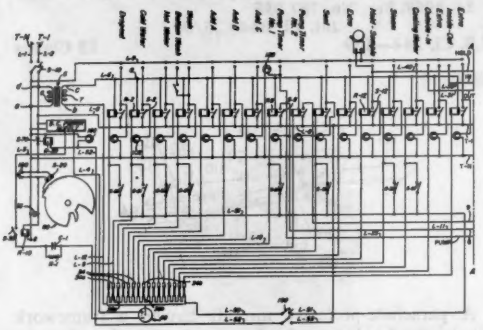
BATCH TEMPERATURE-FUNCTION PROGRAM CONTROLLER

Jefferson Lyle Claiborne, Chattanooga, Tenn., assignor to Dixie Yarns, Inc.

Original No. 3,358,161, dated Dec. 12, 1967, Ser. No. 373,457, June 8, 1964. Application for reissue Nov. 24, 1969, Ser. No. 879,590

Int. Cl. H01h *47/00*

U.S. Cl. 307—140 9 Claims



A batch temperature-function program controller in which a cam having a contoured periphery moves through a path to move two followers, each of which engages the cam 180° apart. A function control mechanism and a batch temperature control device are provided along with means responsive to displacement of the followers to actuate these controls.

PLANT PATENTS

GRANTED AUGUST 10, 1971

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,054
MILKWEED PLANT FAMILY
Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.
Filed Mar. 13, 1969, Ser. No. 808,025
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 1 Claim

A new plant variety of the milkweed family closely resembles the Hoya carnosa compacta variety in structural appearance but is distinguishable from this variety by a more compact growth habit, leaf blades which are distinctively variegated and by certain color characteristics.

3,055
ROSE PLANT
Robert W. Hyde, 1 Putter Place, Crystal River, Fla. 32629
Filed Aug. 19, 1969, Ser. No. 851,502
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical with the variety known as "Swarthmore" (Plant Patent No. 2,444) except for its flower color and fragrance, said flower color being basically light pink, with bright and lighter or darker pink petal edges, and said flowers having a stronger fragrance than those of "Swarthmore."

3,056
ROSE PLANT
Alexander Morrison Cocker, Whitemyres, Lang Stracht, Aberdeen, Scotland
Filed Sept. 4, 1969, Ser. No. 855,433
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the red colors, with a very strong fragrance, stiff flower stems, large flower size, high centered form up to the time of maturity, and glossy foliage.

3,057
APPLE TREE
Harry W. Guengerich, Louisiana, Mo., assignor to Stark Bro's Nurseries & Orchards Company, Louisiana, Mo.
Filed Aug. 15, 1969, Ser. No. 850,681
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by its general resemblance in size, vigor and form to the unnamed and unpatented variety identified as "EM VIII" formerly used extensively as dwarfing interstock, but having a greater tolerance to stem-pitting virus than "EM VIII," said new variety also having superior utility as dwarfing interstock to produce dwarf apple trees about half the size of standard trees grown on seedling rootstock, but which bear earlier and heavily.

3,058
APPLE TREE
Harry W. Guengerich, Louisiana, Mo., assignor to Stark Bro's Nurseries & Orchards Company, Louisiana, Mo.
Filed Aug. 27, 1969, Ser. No. 853,555
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by a taller and less spreading tree habit than the variety identified as "EM VIII" formerly used extensively as dwarfing interstock, and having greater tolerance to stem-pitting virus than "EM VIII," said new variety also having superior utility as dwarfing interstock to produce dwarf apple trees about three-quarters the size of standard trees grown on the usual seedling rootstock, but which bear heavily and at an earlier age.

3,059
ROSE PLANT
Gayle Kent McDaniel, Carlton, Oreg., assignor to Carlton Rose Nurseries, Carlton, Oreg.
Filed Apr. 14, 1969, Ser. No. 816,130
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—21 1 Claim

A hybrid tea rose plant of the greenhouse type, originated by crossing Happiness as the seed parent with an unknown red seedling.

3,060
MAPLE TREE
Daniel P. Schmidt, deceased, late of Portland, Oreg., by Jane E. Schmidt, executrix, 18324 NE. Sandy Blvd., Portland, Oreg. 97230
Filed Feb. 28, 1969, Ser. No. 804,721
Int. Cl. A01h *5/12*

U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of maple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, well-shaped, bushy, free-branching, compact and rapid habit of growth, a good, natural main stem, with ascending branches, giving the tree a broadly pyramidal shape, and an unusually dense form, abundant foliage, distinctive, shapely, crinkly, glossy, deeply incised and finely lobed leaves of attractive medium to dark green color overlaid with reddish bronze, and distinctive, bright red petioles which attractively and conspicuously contrast with the green leaf color.

3,061
APPLE TREE
Harry W. Guengerich, Louisiana, Mo., assignor to Stark Bro's Nurseries & Orchard Company, Louisiana, Mo.
Filed Aug. 27, 1969, Ser. No. 853,554
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by a more vigorous and more spreading tree habit than the variety identified as "EM IX" formerly used extensively as dwarfing interstock, and having greater tolerance to stem-pitting virus than "EM IX," said new variety also having superior utility as dwarfing interstock to produce dwarf apple trees about two-thirds the size of standard trees grown on the usual seedling rootstock, but which bear earlier and heavily.

3,062
APRICOT TREE
Frederic W. Anderson, Merced, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.
Filed Sept. 8, 1969, Ser. No. 856,224
Int. Cl. A01h 5/03
U.S. Cl. Plt.—39 1 Claim

An apricot tree which is of large to medium size, vigorous, spreading, open, and a regular and productive bearer of large to medium size freestone fruit having an average larger size, tougher skin, firmer flesh, and less pit burn than the fruit of the Blenheim (unpatented), long the leading commercial variety of apricot tree grown in the State of California; the fruit of the present variety ripening later than the Modesto (United States Plant Patent No. 2,543) and Patterson (United States Plant Patent No. 2,877).

PATENTS

GRANTED AUGUST 10, 1971

GENERAL AND MECHANICAL

3,597,763

RIGID BIB FOR INFANTS

Laura Helen Frances Funk Bienvenu, 318 Maple Ridge Drive, Metairie, La.

Filed Sept. 26, 1969, Ser. No. 861,441
Int. Cl. A41d *13/04*
U.S. Cl. 2—49 **10 Claims**

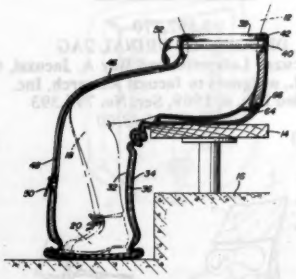
A substantially rigid infant's bib made of self-shape-sustaining sheet material, plastic-coated cardboard or equivalent washable material for example, and such in function and capability that it helps the infant's mother to cope with often exasperating spoon feeding difficulties. It comprises a lightweight rigid panel having suitable attaching and retaining means and which is dimensionally large enough in plan to prevent an over-active infant from lifting his hands and arms too high, getting his hands into his mouth, or reaching his hands upwardly beyond the marginal edges of the bib grabbing the spoon, while being fed. The marginal edge of the panel is provided with an appropriately encompassing C-shaped or equivalent catchall trough.

3,597,764

SPECTATOR PROTECTOR

Harry B. Povey, 1555 Via Hermana, San Lorenzo, Calif.

Filed Aug. 18, 1969, Ser. No. 851,007
Int. Cl. A41d *13/00*
U.S. Cl. 2—69 **4 Claims**



A protective garment enclosing the lower portion of a person employing the device such as a spectator at an outdoor winter sporting event or other persons subjected to cold climatic conditions. The protector is generally in the nature of the lower half of a sleeping bag and includes a pillow structure incorporated into the seat area thereof, a slide-type fastener in the front to facilitate use of the garment and a carrying case into which the garment may be folded to serve as a cushion when the protector is not needed.

3,597,765

SPORT GLOVE

Lari Stanton, New York, N.Y., assignor to Consolidated Foods Corporation, Chicago, Ill.

Filed Nov. 26, 1969, Ser. No. 880,021
Int. Cl. A41d *19/00*
U.S. Cl. 2—159 **1 Claim**

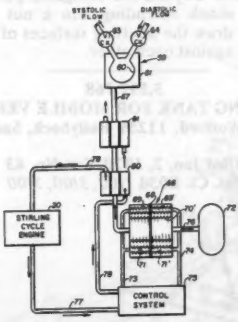
a novel sport glove is constructed of a stretch fabric including spandex fibers in which the glove is provided with an overlying gripping surface of relatively high friction material on its interior surface. The dimensions of the glove and the glove fabric are selected in such a manner that the tensile forces exerted on the wearer's hand assist in the gripping function and exercise the hand.

3,597,766

ARTIFICIAL HEART PUMPING SYSTEM POWERED BY A MODIFIED STIRLING CYCLE ENGINE-COMPRESSOR HAVING A FREELY RECIPROCABLE DISPLACER PISTON

Keith E. Buck, Alamo, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed July 11, 1968, Ser. No. 744,204
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **2 Claims**



A modified Stirling cycle engine operable as a compressor and having its displacer piston directly connected to a reversing piston to which high and low pressures are alternately applied at opposite ends for reciprocably driving the pistons. In one embodiment, the reversing piston is mounted in a double acting compression cylinder which acts as an oscillating spring to drive the pistons whereby energy to sustain oscillation of the reversing piston within the compression cylinder is supplied directly from the displacer piston. In another embodiment, the pistons are driven by high and low

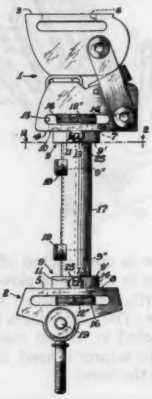
pressure gases alternately applied from respective reservoirs to opposite sides of the reversing piston through valves operated by the reversing piston. The modified Stirling cycle engine is capable of unattended operation over a period of years in an inaccessible location and therefore, is especially well suited for supplying motive power for an artificial heart-pumping system.

3,597,767

ADJUSTABLE TUBULAR SKELETAL SYSTEMS FOR ARTIFICIAL LIMBS

Jan Prahl, Gollenhof, Germany, assignor to William J. Teufel, Stuttgart, Germany

Filed Sept. 3, 1969, Ser. No. 854,860
Claims priority, application Germany, Oct. 2, 1968, P 18 00 500.0
Int. Cl. A61f *1/08*
U.S. Cl. 3—21 **9 Claims**



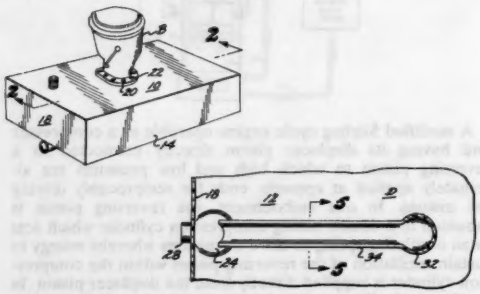
A tubular skeletal system for a limb prosthesis includes a plurality sections some of which are joint sections while others are limb sections. Each joint section terminates in an end surface directed toward a limb section, and this end surface forms part of a wall which is formed with an elongated slot. A connector is connected to a limb section and has a slotted wall terminating in an end surface which engages the end surface of an adjacent joint section. A bolt has a pair of perpendicularly elongated portions which are respectively received in the slot in a connector and in the slot in an adjacent joint section. Beyond the elongated portions, the bolt has a threaded shank extending into a nut which can be turned to tightly draw the abutting surfaces of the connector and joint section against each other.

3,597,768

HOLDING TANK FOR MOBILE VEHICLE

Arthur Walter Wofford, 11259 Hollyhock, Sante Fe Springs, Calif.

Filed Jan. 2, 1970, Ser. No. 43
Int. Cl. E03d *1/00, 3/00, 5/00*
U.S. Cl. 4—10 **6 Claims**



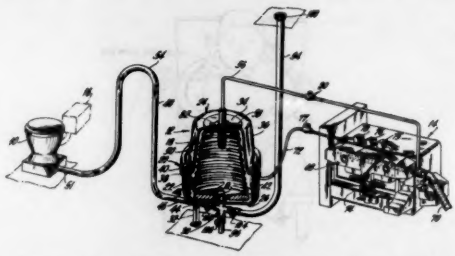
A holding tank for a mobile vehicle having a toilet, said tank having means incorporated in the interior thereof for discharging solid waste material and water from said toilet direct to a sewer line without contaminating the interior of the tank when said vehicle is parked in a trailer lot, but said tank capable of receiving waste material and water for future disposal when said vehicle is being driven or parked at a location where sewer facilities are not available.

3,597,769

WASTE DISPOSAL SYSTEM

Edward C. Brainard, II, and Alexander G. Vrouhart, both of Marion, Mass., assignors to General Time Corporation, Stamford, Conn.

Filed Mar. 13, 1969, Ser. No. 807,028
Int. Cl. E03d *1/00, 3/00, 5/00*
U.S. Cl. 4—10 **14 Claims**



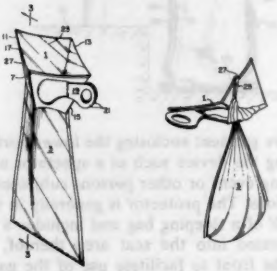
This invention relates to a self-contained, noncontaminating waste disposal system useful over a prolonged period of time with particular utility in passenger carrying vehicles, such as waterborne pleasure craft. The system of the invention provides an impervious container into which is fed waste products and from which liquid effluent is removed by compression of the container. The container can be enveloped by an outer container which causes compression of the inner container. Liquid effluent removed from the inner container is then pasteurized so that only harmless pasteurized effluent is discharged from the system. Removal and pasteurization of effluent, moreover, can be effected even while waste products are being fed to the container. Also, the engine for a passenger carrying vehicle can be used in effecting compression of the container and in pasteurizing the drained effluent. After the container becomes so filled with solid waste products that appreciable amounts of liquid effluent can be no longer removed, the container itself can be removed from the system and either can be disposed of or reused after cleaning.

3,597,770

DISPOSABLE URINAL BAG

Kenneth A. Jacuzzi, Lafayette, and Roy A. Jacuzzi, Oakland, both of, Calif., assignors to Jacuzzi Research, Inc.

Filed Feb. 4, 1969, Ser. No. 796,393
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 **3 Claims**



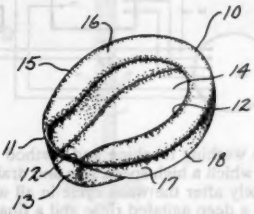
A disposable urinal bag involves a mouth portion of semirigid water disintegratable material, to which is attached

a limp sack of thin plastic. Slits in the mouth portion enable convenient sealing of the bag following use, until disposal thereof.

3,597,771
BEDPANS

Carl H. Rickmeier, Jr., Sheboygan, Wis., assignor to The Vollrath Co., Sheboygan, Wis.

Filed July 9, 1969, Ser. No. 840,287
Int. Cl. A61g 9/00
U.S. Cl. 4—112 **1 Claim**

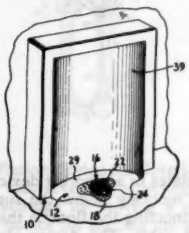


A disposable plastic bedpan is so designed that a plurality of said pans can be stacked in seminesting relation to conserve space. In addition, said bedpan is formed with outwardly and downwardly directed side flanges which engage the mattress when someone is seated thereon on a bed to provide stability and minimize the possibility of tipping, which side flanges also serve as handles to facilitate the withdrawal of the pan, and which side flanges provide increased strength and rigidity and permit the use of relatively lightweight inexpensive plastic in the manufacture of said disposable bedpan.

3,597,772
LAVATORY SANITATION BODIES

Seymour Leavitt, Lincolnwood, and Barry L. Schneider, Chicago, both of, Ill., assignors to Chemtrust Industries Corporation, Maywood, Ill.

Continuation-in-part of application Ser. No. 693,488, Dec. 26, 1967, now Patent No. 3,538,520. This application Dec. 13, 1968, Ser. No. 783,609
Int. Cl. E03d 9/02
U.S. Cl. 4—222 **27 Claims**

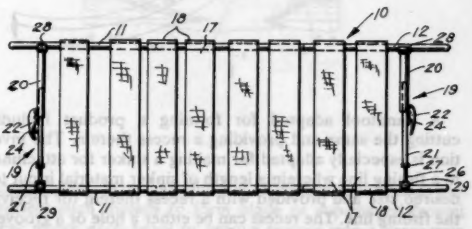


Bodies for use in connection with urinal drains and the like, which are positioned in relation thereto in a manner whereby drain or flush water will come into direct contact with at least a portion of the bodies. The bodies preferably include a solid cleaning and/or sanitizing material which will dissolve in part with each flow of drain or flush water thereby to provide automatic and metered cleaning, disinfecting, deodorizing, and the like, of the urinal. The solid-cleaning and -sanitizing material most useful for urinals is most advantageously in bar or premolded form and comprises, as its essential active ingredients, an intimate admixture of (*a*) one or more synthetic detergents which are solid at room temperatures, and (*b*) an acidic agent in the form of one or more acids or acid-forming salts or both, the ratio of the synthetic detergent to the acidic agent in the solid, sanitizing material ranging preferably from about 1 to 100 of the former to about 1 of the latter. The bodies include a holder, which can be placed in a urinal drain or the like, designed to be made economically and to support the cleaning and sanitizing material in a position where drain or flush water will come into direct and extensive contact therewith.

3,597,773
EMERGENCY STRETCHER

Alva Ray Firestone, P.O. Box 94, San Jon, N. Mex.

Filed Aug. 6, 1969, Ser. No. 848,050
Int. Cl. A61g 7/10; A61q 1/06
U.S. Cl. 5—82 **1 Claim**

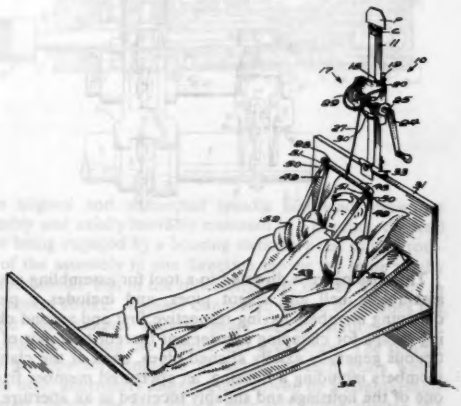


A device for lifting accident victims having possible back injuries. This device includes a plurality of narrow straps which are placed into position beneath the victim one at a time, after which the rails are placed into the ends of the straps and crossbars are locked into place in order that the device will be rendered rigid so that the patient may be carried.

3,597,774
PATIENT MOVING DEVICE FOR ATTACHMENT TO HOSPITAL BEDS

Estel M. Warren, 311 Elizabeth St., Clinton, N.C.

Filed Apr. 7, 1969, Ser. No. 813,825
Int. Cl. A47b 83/04; A61g 7/10
U.S. Cl. 5—84 **3 Claims**



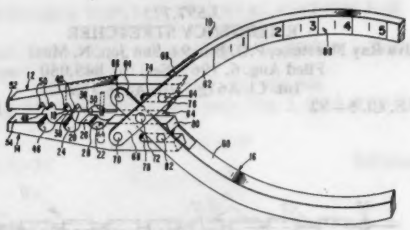
A patient moving device which includes an adjustable post having clamps for attachment to the head of a bed and carrying thereon a winch having a cable wound thereon. A harness is arranged for engagement in the armpits of the patient or is attached to an apron underlying the patient so that upon winding of the winch the cable pulls the harness and thus moves the patient upwardly in the bed.

3,597,775

PRODUCT-FORMING TOOL

Thomas A. McCasland, Mountain View, Calif., assignor to Diversified Electronics Co., Inc., Sunnyvale, Calif.

Filed Oct. 21, 1968, Ser. No. 769,242
Int. Cl. B25b 7/22
U.S. Cl. 7—5.3 1 Claim



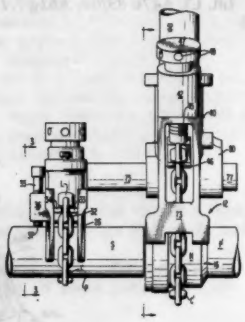
A handtool adapted for forming a product including cutting the same and providing a recess therein. The invention is especially adapted for making a sinker for attachment to a fishing line wherein a length of sinker material is cut to a desired size and provided with a recess therein for receiving the fishing line. The recess can be either a hole or a groove in the sinker.

3,597,776

TOOL FOR CUTTING, JOINING AND DISCONNECTING BELL AND SPIGOT PIPES

Crawford B. Saunders, RR5, Box 5459, Albuquerque, N. Mex.

Filed Apr. 3, 1969, Ser. No. 813,051
Int. Cl. B25f 1/00; B23p 19/04
U.S. Cl. 7—14.1 20 Claims



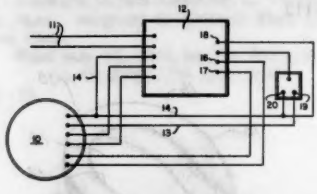
This disclosure is directed to a tool for assembling and disassembling bell and spigot pipes, and includes a pair of clamping members having respective first and second clamping means for clamping securement thereof to a pair of contiguous generally axially aligned pipes, each of the clamping members including a housing, an apertured member fixed to one of the housings and slidably received in an aperture bore of the other of the housings whereby a tool selectively positioned within the apertures may be manipulated to impart relative movement of the clamping members toward and away from each other for respectively assembling and disassembling the pipes, one of the clamping members having a tubular handle, and pipe cutting means in the form of a flexible member carrying a plurality of cutting elements being retractably supported interiorly of the tubular handle.

3,597,777

CLOTHES WASHING MACHINES AND METHODS OF OPERATING THE SAME

Peyton W. Douglas, Lakewood, N.Y., assignor to Blackstone Corporation

Filed Jan. 19, 1970, Ser. No. 3,748
Int. Cl. D06f 33/02, 37/36
U.S. Cl. 8—159 4 Claims



A clothes washing machine and method of operation are provided in which a high speed spin and drain cycle is locked in immediately after the wash cycle in all washing programs followed by a deep agitated rinse and a final high speed spin and drain for regular clothes and a final slow speed spin and drain for delicate fabrics and wash and wear clothes.

3,597,778

MOORING DEVICES

Hans Castelliz, Halifax, Nova Scotia, Canada, assignor to E M I Limited, Hayes, England

Filed Sept. 20, 1967, Ser. No. 654,892
Claims priority, application Great Britain, Aug. 19, 1966, 37,147/66
Int. Cl. B63b 21/52
U.S. Cl. 9—8 10 Claims

The invention relates to a mooring device which includes a float intended for mooring below the surface of the sea, a sinker, a cable connecting the float to the sinker and means for paying out the cable. The device also includes control means for regulating the pay out of the cable in response to the ambient pressure at the float so as to tend to maintain the float at a predetermined depth below the surface during the mooring process, and in addition locking means operative to lock the paying out means when paying out ceases.

3,597,779

MULTICONDUIT BUOYED UNDERWATER LINE

George W. Morgan, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed Nov. 5, 1969, Ser. No. 874,163
Int. Cl. H02g 9/12
U.S. Cl. 9—8 R 11 Claims

A flexible underwater line has a plurality of conduits layed in a helical configuration about a central core member. The

central core member in turn has a group of spokes, extending radially therefrom and each group is disposed at spaced intervals along its length. The conduits are layed between the spokes so that the spokes protrude above the conduits and a ring-buoy is clamped about each group of spokes so that the spokes prevent the buoys from moving axially along the central core member.

3,597,780

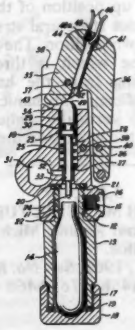
AUTOMATIC INFLATION DEVICE

Jan R. Coyle, P.O. Box 297, Milford, Utah

Filed Nov. 3, 1969, Ser. No. 873,572

Int. Cl. B63c *9/18*

U.S. Cl. 9—316 **8 Claims**



An automatic inflation device for flotation gear, in which a manually operable cam lever for effecting the release of gas from a pressure cartridge by moving a punch, is provided with a pyrotechnic device for shifting the punch for releasing the gas without requiring operation of the cam lever.

3,597,781

SELF-TAPPING THREADED BUSHINGS

Carl B. H. Eibes, deceased, 11 Dr. Carl-Eibes Str., late of Schnaittenbach; Christian Eibes, 11 Dr. Carl-Eibes Str.; Carl-Herwig Eibes, 30, Berlin-Schoneberg, and Maria-Theresia Wagner, nee Eibes, heirs, Hans Klopferweg Nr. 1 Amberg, all of Schnaittenbach, Germany

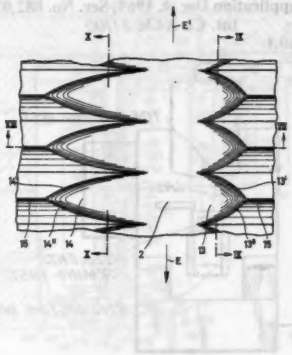
Filed May 31, 1968, Ser. No. 733,562

Claims priority, application Germany, June 5, 1967, K 62 476

Int. Cl. B21k *1/44*; B23g *9/00, 7/00*; B21h *3/02*

U.S. Cl. 10—10 **6 Claims**

The disclosure relates to a threaded bushing which, upon entering and turning in the initially smooth bore of the work piece, will form through its own male thread the corresponding internal thread within the wall of the work piece bore. The bushing is formed with one or more exterior bevels or grooves which extend axially over at least several threads and intersect such threads to form blade or cup-shaped frontal areas where each bevel or groove merges into a respective thread.



3,597,782

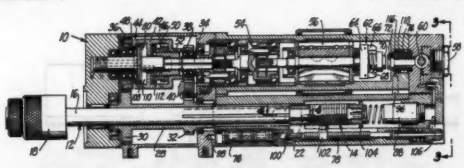
POSITIVE FEED AND POSITIVE RETRACT TAPPING DEVICE

Robert C. Quackenbush, Glendale, Calif., assignor to Arthur B. Quackenbush, Glendale, Calif., a part interest

Filed Dec. 23, 1968, Ser. No. 786,174

Int. Cl. B23g *1/00*; B23q *5/32*

U.S. Cl. 10—136 **11 Claims**

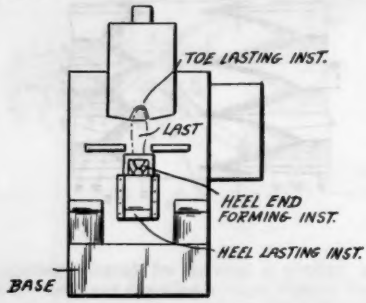


An aligned and connected spindle and lead screw are rotatably and axially movably mounted in a housing, the lead screw being engaged by a housing stationary nut so that rotation of the assembly in one direction moves the same axially in a feed stroke and in the other direction moves it axially in a retraction stroke. A spline connected sleeve telescopes the spindle and mounts spindle gears axially stationary and rotatable for driving the spindle and lead screw. The spindle gears are operably engaged by aligned clutch gears which are, in turn, alternately engaged and driven by a countershaft mounted clutch, the one clutch gear and clutch driving the spindle and lead screw in the one direction of rotation and the other clutch gear and clutch driving the spindle and lead screw in the other direction of rotation. A partially governor controlled drive motor is connected to the clutch through the countershaft, the drive motor being governor controlled for selective constant speed during the spindle and lead screw lead stroke and being free of governor control for high speed during the spindle and lead screw retraction stroke.

3,597,783
HEEL AND TOE LASTING APPARATUS

Herbert K. Klantke, Lemberg, Germany; Henry Von Den Benken, West Roxbury, Mass., and Robert B. Dunlap, Medway, Mass., assignors to E. G. Henkel Maschinenfabrik, Neu-Isenburg, Germany and Compo Industries, Inc., Waltham, Mass.

Division of Ser. No. 730,081, May, 17, 1968, Pat. No. 3,523,317.
This application Dec. 4, 1969, Ser. No. 882,033
Int. Cl. A43d *21/00*
U.S. Cl. 12—10.1 22 Claims

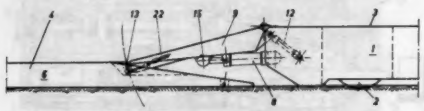


A shoe lasting machine having a support on which the toe of the last may be placed and held and instrumentalities at the toe for operating on an upper and insole assembled on the last, said instrumentalities comprising adjustably mounted pincers adapted to grip the lasting margin at the tip, along the sides and at the waist and to pull it taut about the toe and forwardly with reference to the heel, and wipers for wiping the lasting margin inwardly against the insole.

3,597,784
VEHICLE WITH DISMOUNTABLE RAMP

Hermann Walter Gehlen, Pirmasenserstrasse 60, 675 Kaiserslautern, Upper Palatinate, Germany

Filed July 16, 1969, Ser. No. 842,168
Claims priority, application Germany, Apr. 12, 1969, P 19 18 600.6
Int. Cl. E01d *1/00*
U.S. Cl. 14—1 5 Claims

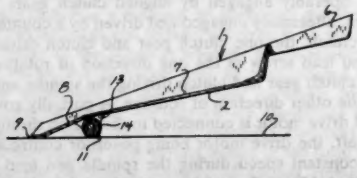


Vehicle with dismountable ramp that is linked to one end of the vehicle and the vehicle is equipped at both ends with additional short driveon ramps.

3,597,785
CLEANING DEVICE

Norman P. Zinda, Milwaukee, Wis., assignor to Robert E. Head, Milwaukee, Wis., a part interest

Filed June 11, 1969, Ser. No. 832,297
Int. Cl. A47l *13/40, 13/52*
U.S. Cl. 15—1.5 7 Claims



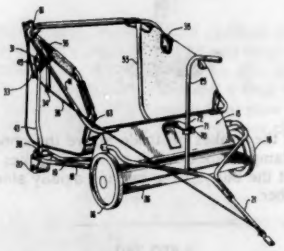
A dustpan or tray having a front edge to be held against the surface to be cleaned and the dirt or debris is adapted to be swept across the front edge into the pan.

A resilient roller is mounted for rotation on the under surface of the pan and extends generally parallel to the front edge. The roller aids in positioning the front edge at the proper angle during sweeping of debris into the pan and, after sweeping, the roller is adapted to be rolled over the ridge of residual dirt remaining on the surface. The residual dirt clings to the roller so that all of the residual dirt can be removed.

3,597,786
MATERIAL COLLECTOR WITH BACK DUMPING HAMPER

Walter Franklin Ruhl, Greenville, Ohio, assignor to Lambert Incorporated, Dayton, Ohio

Filed May 27, 1969, Ser. No. 828,167
Int. Cl. E01h *1/04*
U.S. Cl. 15—79 9 Claims



A lawn sweeper having a removable hamper for collecting projected material which can be dumped rearwardly from a pulling vehicle by means of a rope and which automatically returns to down position upon rope release. The lawn sweeper chassis is connected to the hamper by a support means which limits the up position of the hamper to insure automatic return, provides structural strength, and serves to secure the hamper in down position. The back dumping is accomplished by the rope which is threaded progressively through levers depending from the hamper pivot means which provide a significant mechanical advantage. The material projector is vertically adjustable through a mechanism operable by the person on the towing vehicle.

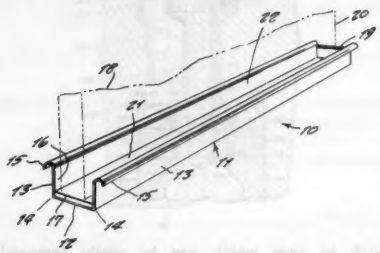
3,597,787
BRUSH MANUFACTURE

Henry J. Rosendall, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.

Filed Apr. 1, 1969, Ser. No. 811,858
Int. Cl. A46b *3/16;* A46d *1/08*
U.S. Cl. 15—179 13 Claims

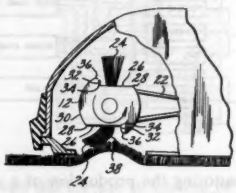
A brush backing of relatively rigid foamed cellular polyurethane is pierced at a plurality of locations to form openings for receiving unitary bristle tufts. The piercing action creates barbs in the backing which firmly secure the tufts. The pierced openings may be formed to receive circular as well as flat tufts.

3,597,788
BOTTOM DOOR SEALER
Frank J. Eisenschenk, R.R. #1, Richmond, Minn.
Filed Dec. 22, 1969, Ser. No. 888,208
Int. Cl. B05c 1/02
U.S. Cl. 15—244 R 2 Claims



A tool for applying a sealer-soaked sponge pad on the underside of a door so to seal the underside of the door against dampness, the device comprising a shallow pan slidable under the door, the pan containing an approximately ⅜-inch-thick sponge which is then pressed to the underside of the door for a period of time until the sealer has soaked into the underside of the door, after which the pan and sponge are removed.

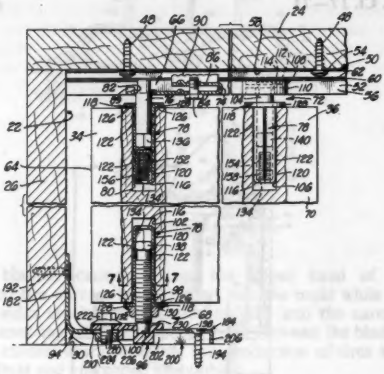
3,597,789
VACUUM CLEANER
Wilton E. Boyd, Mayfield Heights, Ohio, assignor to General Electric Company
Filed Mar. 13, 1970, Ser. No. 19,392
Int. Cl. A47l 9/04
U.S. Cl. 15—383 6 Claims



An electric vacuum cleaner having a generally cylindrical brush roller positioned in the suction nozzle of the vacuum cleaner wherein the brush roller includes a wall positioned adjacent to and extending outwardly from portions of the brush bristles for causing the bristles to bend over when a carpet is sucked partially into the suction nozzle. This construction reduces the resistance of the bristles on the carpet pile thereby preventing the brush from stalling.

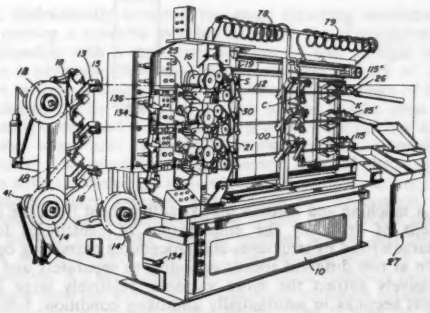
3,597,790
FOLDING DOOR HARDWARE
Kenneth K. Kellems, Ontario, and Robert Brydolf, Pasadena, both of, Calif., assignors to Acme General Corporation, Monrovia, Calif.
Continuation of application Ser. No. 475,685, July 29, 1965, now abandoned. This application Nov. 29, 1968, Ser. No. 781,695
Int. Cl. E05d 7/08
U.S. Cl. 16—151 7 Claims

A pivot or guide assembly for folding doors comprising a sleeve secured in its door-edge opening by driving it therein-to inner-end-first. The sleeve is hexagonal to receive a hexagonal portion of a pivot or guide pin to prevent rotation of the pin while permitting vertical adjustment of the position thereof. Springs bias certain of the pins in such a way that the corresponding sleeves can be driven through the pins without damaging the springs. In one form, an annular retainer secures a rotatable nut to the outer end of the sleeve and the pin threadedly engages the nut so that rotation of the nut displaces the pin longitudinally of the sleeve without rotation of the pin. The sleeve is a split sleeve and the annular retainer



limits spreading of the segments thereof. The disclosure also includes a folding-door bottom pivot assembly which includes a pivot bracket and a pivot socket adjustable relative thereto to adjust the horizontal position of the pivot axis of the door.

3,597,791
METHOD FOR PRODUCING SHIRRED FOOD CASINGS
Walter V. Marbach, Palos Heights; Victor K. Naudzius, Chicago, and Edward S. Sherman, Palos Heights, all of, Ill., assignors to Union Carbide Corporation
Division of Ser. No. 661,689, Aug. 18, 1967, Pat. No. 3,503,093, this application Oct. 22, 1969, Ser. No. 871,353
Int. Cl. A22c 13/00
U.S. Cl. 17—49 2 Claims



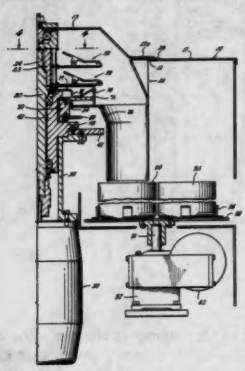
Shirring and compression of food casings are accomplished on a multimandrel machine having common drive and control systems for a plurality of casing strands, the steps of shirring, compacting and severing being performed on each mandrel independent of action on each other mandrel despite common drive mechanism. Provision is made for detecting and remedying discontinuities in casing material supplied to each mandrel and automatic systems reject casing lengths deviating form a predetermined standard.

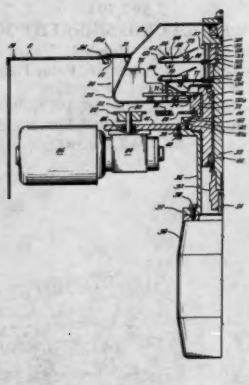
3,597,792

CRAB MEAT EXTRACTION APPARATUS AND METHOD

W. Lee Lockerby, Houston, Tex., assignor to Avico, Inc., Houston, Tex.

Division of Ser. No. 697,966, Jan. 15, 1968, Pat. No. 3,548,449, this application Dec. 8, 1969, Ser. No. 880,450
Int. Cl. A22c 29/00
U.S. Cl. 17—71 6 Claims





A machine and method for extracting meat from the body shells of crabs by the employment of centrifugal force, characterized by structures and procedures permitting operation at two different speeds operative to separately and successively extract the more valuable, relatively large lump meat sections in substantially unbroken condition; followed by extraction of the smaller, less valuable, flake meat sections.

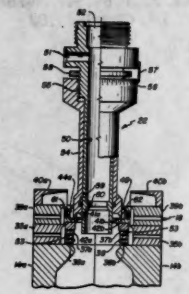
3,597,793

BOTTLES AND THE METHOD AND APPARATUS FOR FORMING THEM

Gerhard H. Weller, Des Plaines, and Henry Komendowski, Evanston, both of, Ill., assignors to Automatic Liquid Packaging, Inc., Elk Grove Village, Ill.

Filed May 28, 1969, Ser. No. 828,589
Int. Cl. B29c 1/00
U.S. Cl. 18—5 BF 20 Claims

Improved methods and apparatus are disclosed for blowing, filling and hermetically sealing bottles having end closures such as caps which can be easily removed and thereafter used to reclose or reseal the bottles.

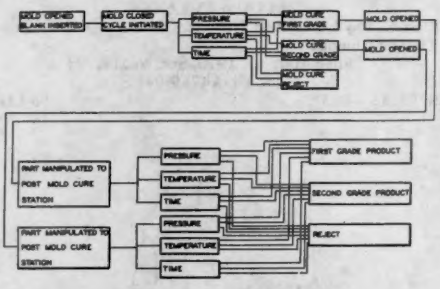


3,597,794

MULTIFUNCTION PRODUCTION MONITOR

Charles G. Mann, Farmington, Mich., assignor to Weltronic Company, Southfield, Mich.

Filed Nov. 29, 1968, Ser. No. 779,949
Int. Cl. B29g 1/00
U.S. Cl. 18—2 HA 11 Claims



A system for monitoring the production of a work station wherein a plurality of process functions must be performed for a satisfactory product. The plurality of functions are sensed in the system to actuate a product count. The functions can be defined by limits on a range as temperature, pressure or curing time. Sequencing of the functions can be critical as where pressure must be imposed prior to heating an article being processed to produce a count of a satisfactory product. Combinations of function limits and sequences of functions can be utilized to indicate an acceptable process cycle. Several processes can be imposed on the product with a grading of the final product dependent upon the grading of intermediate product and process parameters. Several grades of product can be sensed and counted in the system depending upon the values or sequences of functions being performed. For example, a cure time outside the limits for a prime grade product, if within the looser limits of a secondary grade product causes the resultant product, other functions being within limits, to be counted as a secondary grade product.

3,597,795

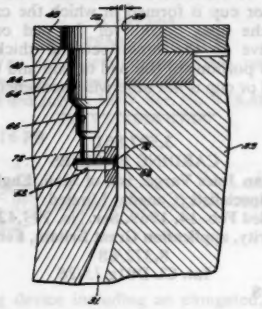
DIE HEAD FOR THE CONTINUOUS EXTRUSION OF PLASTIC FILM WITH PROFILES FOR A CLOSURE FOR USE IN PLASTIC BAGS

Kakuji Naito, No. 49, 1-chome, Watarida-shir-machi, Kawasaki-shi, Kanagawa-ken, Japan

Filed Oct. 7, 1968, Ser. No. 765,295
Int. Cl. B29d 23/04
U.S. Cl. 18—14 R 7 Claims

A die head for the continuous extrusion of plastic for the

manufacture of a plastic film having profile ledges for the bag closure which serves for the formation of plastic bags.

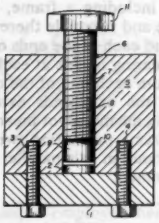


3,597,796

DIE FOR PREPARATION OF FUSED SALT DISCS FOR INFRARED SPECTROSCOPIC ANALYSIS

Robert Ehrlich, Morristown, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,203
Int. Cl. B30b *1/20*
U.S. Cl. 18—16 R 4 Claims



An improved die for use in casting of fused impregnated discs for infrared spectroscopic analysis, particularly where air and moisture are a problem. The improvement resides in the combination of a removably fastened base on a threaded die body and a single threaded plunger to fit the bore of the die. When the base is fastened to the die body, it acts as a supporting structure for an anvil seated at the bottom of the threaded die bore. In operation the impregnated salt to be pelleted is introduced into the threaded die bore onto the anvil positioned at the bottom of the bore, being secured in the bore by the fastened removable base. The plunger is thereafter screwed into the threaded bore until sufficient pressure is applied to produce a salt disc or pellet between the anvil and the plunger. The base is then removed and by turning the plunger a few more times, both the anvil and the fused disc are ejected from the die.

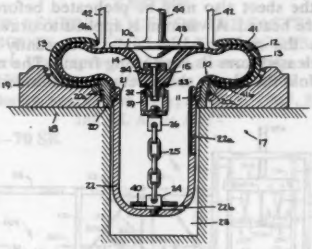
3,597,797

TIRE-VULCANIZING PRESS

Martin Delille, Aachen, Germany, assignor to Uniroyal Engelbert Deutschland AG, Aachen, Germany

Filed Oct. 30, 1969, Ser. No. 872,540
Claims priority, application Germany, Nov. 14, 1968, P 18 08 742.8
Int. Cl. B29h *5/02*
U.S. Cl. 18—17 W 14 Claims

A bladder press of the well type adapted to enable belted tires and especially radial ply tires to be cured with bladders of generally conventional shape, is disclosed. The press is equipped with a tension member for limiting bladder expansion in the axial direction, the member being anchored at one end of thereof in the well and at the other end to the inwardly projecting vertex of a bell-shaped depression provided at the free, closed end of the bladder. The maximum length of the tension member is so chosen that the uppermost part of the bladder cannot engage the upper bead of the preshaped tire carcass being loaded into the mold while the bladder sides are being expanded radially into the carcass, thereby enabling air to be expelled from between the bladder and the carcass and preventing the production of tires with bead defects and entrapped air bubbles.

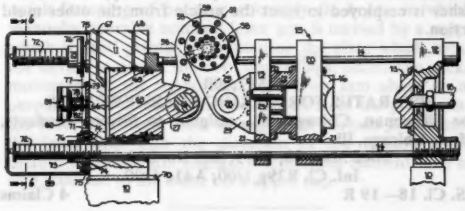


3,597,798

TWO-STAGE CLAMPING MECHANISM

David I. McDonald, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 20, 1970, Ser. No. 21,446
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 LV 10 Claims



A hydraulically actuated two-stage clamping mechanism for moving a movable member into and out of cooperative relationship with a stationary member. A pair of rigid link arms is pivotally interconnected at one end of each of the arms to form a toggle which comprises the first stage of the mechanism. The free end of one of the toggle arms is pivotally connected to a stationary portion while the free end of the other arm is pivotally connected to a movable member. The pivotally interconnected ends of the toggle arms define a knee-type joint which incorporates an integral hydraulic rotary actuator which upon the application of hydraulic pressure, causes relative motion between the arms and thereby moves the movable member toward and away from the stationary member. The second stage of the mechanism is a large diameter, short travel clamping piston to firmly hold the movable and stationary members together. Additionally, adjustment means are provided to vary the initial spacing between the two stationary members.

3,597,799

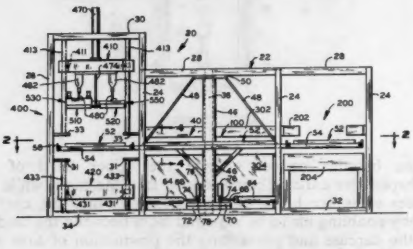
APPARATUS FOR VACUUM FORMING HOLLOW PLASTIC ARTICLES

Herbert J. Earle, Ann Arbor, Mich., assignor to The Mather Company, Toledo, Ohio

Filed Feb. 24, 1969, Ser. No. 801,446
Int. Cl. B29c *17/00*
U.S. Cl. 18—19 H 10 Claims

An apparatus for forming at least one planar sheet of heat-fusible plastic into a hollow article by heating the plastic

sheet to its fusion temperature; folding the heated sheet so as to bring preselected portions of the sheet together and holding other portions thereof spaced apart; and fusing the contacting portions together. An open frame supports and holds opposite edges of the heat-fusible plastic sheet during the heating of both planar surfaces of the sheet and the moving of the sheet parallel to a two section hinged planar mold. The edges of the sheet also may be preheated before its planar surfaces are heated. A vacuum is applied to draw the heated sheet into the mold cavities and concurrently the heated sheet is released form its supporting frame. The mold is then folded to fold the plastic sheet between the folded sections of



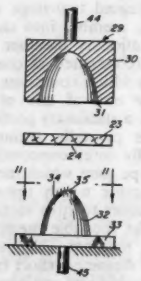
the mold, which sections are then clamped in their folded positions. If desired, a sheet of insulation, such as of plastic foam, may be inserted between the folded portions of the sheet before the mold sections are folded together. Next these clamped sections are pressed to fuse together preselected portions of thefolded sheet. These preselected portions may have been further heated before fusion and a cooling medium may be circulated through the mold sections to set the formed article. Compressed air then may be applied to one of the mold sections to release the article from that one section as the mold is opened. Lastly, air and/or a pusher is employed to eject the article from the other mold section.

3,597,800

APPARATUS FOR MAKING BRASSIERE PADS

Abe Silverman, Chicago, Ill., assignor to Silveco Products, Inc., Chicago, Ill.

Filed Mar. 20, 1969, Ser. No. 808,959
Int. Cl. B29g *1/00*; A41c *5/00*
U.S. Cl. 18—19 R **4 Claims**



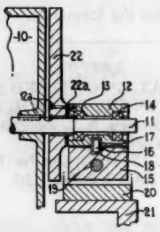
Molded seamless brassiere pads or cups made from thermoplastic adhesive bonded nonwoven fibrous batting and an apparatus and method for molding the same without thinning of the cross-sectional area of the apex portion of the brassiere pad or cup relative to the cross-sectional thickness of the remaining wall portions of the pad or cup. To this end a central portion of the blank from which the pad is molded under heat and pressure is subjected prior to the molding operation to the action of a coolant to prevent the thermoplastic adhesive bond in the bonded nonwoven fibrous batting from being softened during the molding operation. The thus cooled central portion of the body of the blank is held in position in the mold by piercing elements mounted on the male mold member and which project into the loosely arranged fibers in the cooled central area of the inner surface of the body of the blank without forming unsightly or objectionable holes or other marks therein. A molded seamless brassiere pad or cup is formed in which the cross-sectional thickness of the apex portion of the pad or cup is not reduced relative to the cross-sectional thickness of the remaining wall portions of the pad or cup and the apex portion of the pad or cup is not otherwise weakened.

3,597,801

CARDING ENGINES

John Maximilian Jules Varga, Isle of Man, England, assignor to Carding Specialists (Canada) Limited

Filed Feb. 14, 1969, Ser. No. 799,425
Claims priority, application Great Britain, Feb. 21, 1968, 8,372/68
Int. Cl. D01g *15/28*
U.S. Cl. 19—98 **9 Claims**



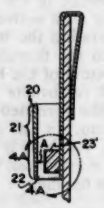
A carding engine including a frame, an axle, a cylinder mounted on said axle and rotatable therewith, bearing means between the frame and each of the ends of the axle, a bearing block housing said bearing means at each end of said axle, a bend spaced apart from each end of the cylinder and fixed to the bearing blocks, the axle ends extending through the bends into the bearing means, pivot means between the bearing blocks and the frame permitting swiveling movement of the bearing blocks about an axis parallel to the frame and an axis vertical to the frame.

3,597,802

WRITING IMPLEMENT HOLDER

Larrie D. White, 136 E. 3rd South, Logan, Utah

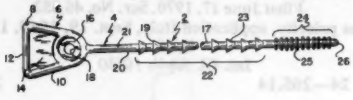
Filed Oct. 31, 1969, Ser. No. 872,986
Int. Cl. B43k *25/00*
U.S. Cl. 24—11 CT **7 Claims**



The present invention comprises a writing implement holder having a front plate provided with a holder yoke and a clip portion contiguous with and cooperably associated with the front plate, whereby the implement may be attached to a book. The holder yoke is advantageously tapered for proper clip reception and retention. The writing implement holder includes resilient means having separated resilient portions which cooperate with respective ones of writing implements inserted in the holder so as to frictionally retain the same in place in stored position. Independent operation of the individual resilient portions preclude insertion of additional implements from affecting retention of implements previously

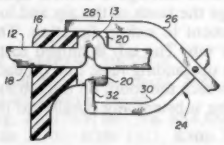
stored in the holder. Individual portions of the resilient means may comprise fingers, resilient pad portions, or equivalent means.

3,597,803
FASTENING DEVICE
Clarence R. Van Neil, North Olmsted, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed July 2, 1969, Ser. No. 838,480
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **10 Claims**



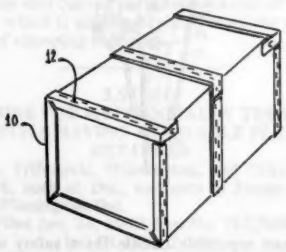
A fastening device including an elongated, flexible body having a tail end portion and a grip end portion providing a straplike construction for assembly around a bundle or the like. The grip end portion has an aperture therein and the body includes a plurality of spaced enlargements disposed between the end portions for resilient interlocking engagement with the margins of the aperture upon insertion of the tail end portion through the aperture for locking assembly with the bundle in the installed position thereof.

3,597,804
BUNDLING STRAP-LOCKING TECHNIQUE
George H. Geisinger, Union County, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Sept. 13, 1969, Ser. No. 857,826
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **2 Claims**



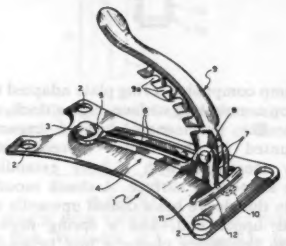
The locking technique employed herein requires the displacement of a portion of the strap body from its normal plane into transverse slots in the face of the head member of such bundling strap. In an alternative embodiment, a special web is provided across one of the facial transverse slots; such web is displaced into and along with the strap body portion into a second transverse facial slot in order to provide the necessary locking.

3,597,805
CONTINUOUS STRIP FASTENER
Andrew J. Powell, Jr., 1215 N. Orange Grove Ave., W. Hollywood, Calif.
Filed Feb. 17, 1969, Ser. No. 799,660
Int. Cl. B65d *63/02*
U.S. Cl. 24—20 **1 Claim**



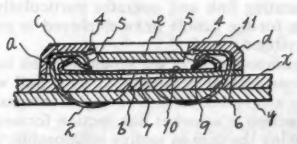
The invention concerns itself with a continuous nailing strip comprising a multiplicity of tangs, each tang being integral with the strip at one end and disconnected from said strip at the other end and being L-shape. The tang being narrower than the strip. The disconnected end can be hammered into wood such as sheet plywood. The plywood then becomes the ends, sides and top of a resulting shipping container.

3,597,806
TRACTION LEVER DEVICE FOR THE FASTENING OF BOOTS, PARTICULARLY SKI BOOTS
Icaro Olivieri, Via Caprera 4, Lecco, Como, Italy
Filed Nov. 25, 1969, Ser. No. 879,642
Claims priority, application Italy, Apr. 11, 1969, 51396/69
Int. Cl. A43c *11/14*
U.S. Cl. 24—70 SK **2 Claims**



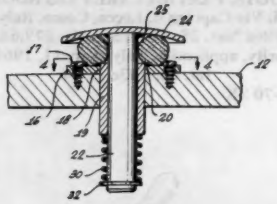
This invention provides a traction lever device for the quick fastening of boots, particularly ski boots, in which a manually operable notched lever arm is carried by a support which is itself pivotally mounted on the plate which secures the device to one of the boot upper flaps, permitting rocking movement of the support and the lever arm about an axis perpendicular to the plate and spaced from the pivot axis of the lever arm itself. This arrangement permits alignment of the lever arm with the direction of the tension applied thereto when the arm engages a tensioning element such as a ring attached to the other boot upper flap.

3,597,807
FASTENING DEVICE AND A PROCESS FOR MAKING THE SAME
Kouzo Yasuoka, c/o Suikoh Komori No. 17 Shibuse-cho, Kitashiraka, Kyoto, Japan
Filed June 2, 1969, Ser. No. 829,212
Claims priority, application Japan, Aug. 26, 1968, 43/61023
Int. Cl. A44b *9/12*
U.S. Cl. 24—87 **3 Claims**



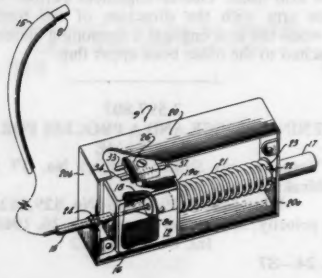
An archwise-curved needle has a basic portion which is on a level with the surface of a fastening device, and which is pivotally attached to said body. Said curved needle is so provided as to go through the back of said body. Said body is also provided with an elastic piece to restrain by its elasticity the pivotal movement of said curved needle.

3,597,808
LINE CLAMP
Philip L. Johnson, 9710 Ocean Gate, Ingelwood, Calif.
Filed June 4, 1970, Ser. No. 43,432
Int. Cl. F16g *11/04, 11/14*
U.S. Cl. 24—127 **3 Claims**



A line clamp comprising a ring plate adapted to be secured in position on a mounting surface, e.g., a deck, or other platform, or the like, by means of headed screws, and with a sleeve mounted in the center thereof and projecting downwardly therefrom with a bore extending into and through the supporting surface. A shank mounted for axial movement in this sleeve has a dished upwardly convex clamp plate on its upper end, and a spring draws the shank downward to releasably clamp a line between the dished head and the mounting ring.

3,597,809
SEPARATING LINK
Burke J. Crane, Lombard, Ill., assignor to Rixson Inc., Franklin Park, Ill.
Filed Aug. 11, 1969, Ser. No. 848,955
Int. Cl. A44b *17/00*
U.S. Cl. 24—201 LP **10 Claims**



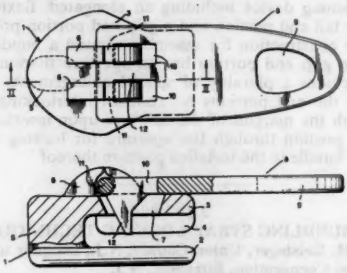
A separating link and operator particularly adapted as a substitute for the fusible links employed in prior art closure control systems.

A first embodiment of the separating link has two link sections whose joinder is controlled by a pull wire latch. One section is a cam link section having an integral ball cam. The second section is a socket link section formed with a socket for receiving the cam in mating relationship. A pair of locks couple the link sections together. The latching engagement of one lock is dependent upon the latching engagement of the other or operating lock.

The pull wire latch is connected to a magnetizable armature which reciprocates within a solenoid. Upon deenergization of the solenoid, the pull wire latch is removed from the operating lock thus disengaging this lock. The ball cam then partially separates the two links sections with a resultant disengagement of the dependent lock. Accordingly, the links sections are fully separated in response to external forces applied by a closure, for example.

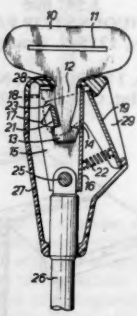
A modification is incorporated within a second embodiment by which each link is a sandwich of elements including a fusible layer. This embodiment thus fully separates in response to excessive heat which causes melting of one or both of the fusible layers, or, alternatively, in response to the removal of the pull wire latch.

3,597,810
ZIP FASTENER SLIDER
Vincenzo Ilotte, Turin, Italy, assignor to Remmert Valle & Co. Societa per Azioni, Turin, Italy
Filed June 17, 1970, Ser. No. 46,852
Claims priority, application Italy, Sept. 19, 1969, 19,805 B/69
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 **2 Claims**



A sliding clasp for a zip fastener having a tab with a tooth which can extend through a central aperture in the sliding clasp to engage the teeth of the zip and lock the sliding clasp against movement in either direction. The tooth is perpendicular to the tab. The tab is hinged to the sliding clasp by means of two upstanding lugs, one on each side of the aperture through which the tooth on the tab extends when the tab is rotated to be substantially parallel to the body of the sliding clasp.

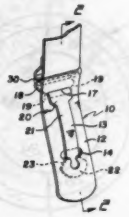
3,597,811
SEAT BELTS FASTENER
Douglas J. Cunningham, Chichester, England, assignor to Wingard Limited, Chichester, England
Filed Mar. 6, 1970, Ser. No. 17,228
Claims priority, application Great Britain, July 11, 1969, 34,982/69
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **7 Claims**



In a two-part separable buckle for a safety seat belt for vehicles, one part comprises a flat shank having a step on at least one side edge and adapted to enter between parallel walls of a frame member in the other part, and a latch

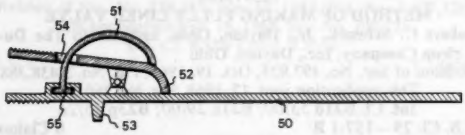
member mounted to rock on the frame carries a pawl working in aligned sector-shaped openings in the walls and adapted to engage with the step in the shank of the first part when that is pressed home into the frame.

3,597,812
SUSPENDER CLIP
Gust Allan, 3757 Eaton Street, North Burnaby, British Columbia, Canada
Filed Oct. 29, 1969, Ser. No. 872,106
Int. Cl. A44b 21/00
U.S. Cl. 24—245 FF 6 Claims



A suspender clip for women's stockings which is formed from a strip of plastic material, the strip being divided into two parts by a fold line about which the two parts may be folded into face-to-face relationship. The part to one side of the line forms a base and part to the other side a tongue with a widened tip. The base has a keyhole opening through it of which the narrow part is not so broad as the tip of the tongue and the wider part will allow the passage of the tongue therethrough.

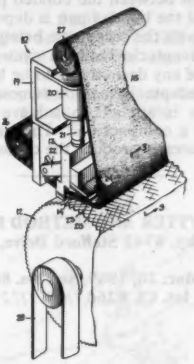
3,597,813
CLAMPING DEVICE
Kiyoshi Takahashi, and Akira Takahashi, both of 140 Sakai 1-chome, Edogawa-ku, Tokyo, Japan
Filed Aug. 29, 1969, Ser. No. 854,066
Int. Cl. A44b 21/00; B29c 1/02; B30b 7/00
U.S. Cl. 24—67.5 6 Claims



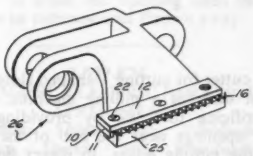
A clamping device comprising a pair of clamping members pivotably fixed to each other, one of said clamping members having an elongated opening through which extends a clamping spring and an arcuately curved leading end portion while the other clamping member has the arcuate compression spring for clamping which extends through said opening and presses against said curved portion the center of the radius of curvature of which is slightly deviated from the pivotal point of said pair of clamping members.

3,597,814
MACHINE FOR MECHANICALLY TREATING MATERIALS HAVING A MOVABLE FLEXIBLE RETARDER
Alexander L. Trifunovic, Wilmington, and Charles R. Kase, Jr., Newark, both of, Del., assignors to Joseph Bancroft & Sons Co., Wilmington, Del.
Filed Jan. 24, 1969, Ser. No. 793,740
Int. Cl. D06c 21/00
U.S. Cl. 26—18.6 22 Claims

The flexible retarder which is of a higher coefficient of friction than the primary surface is mounted so as to be moved relative to the driving roll to avoid excessive wear. The flexible retarder can be an endless belt, a jacketed roller or an elongated strip. The flexible retarder is moved continuously or intermittently to expose fresh surfaces to the material being compacted in relation to the wear of the flexible retarder during treatment.

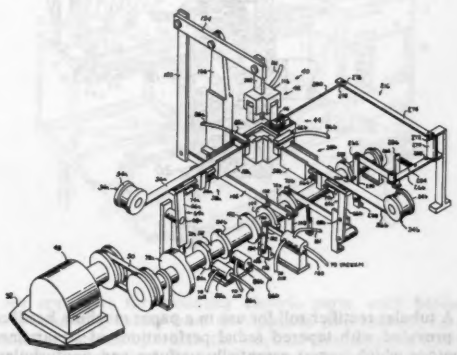


3,597,815
PIN RACK FOR TENTER CHAIN LINK
Kenneth Elton Fish, Warwick, R.I., assignor to Bevis Industries, Inc., Providence, R.I.
Filed Aug. 1, 1969, Ser. No. 846,679
Int. Cl. D06c 3/10
U.S. Cl. 26—62 4 Claims



This invention relates to the pin rack carried by the rack carrier of a tenter chain link, such as used, for example, in machines for drying cloth or the like.

3,597,816
APPARATUS FOR FABRICATING MULTILAYER ELECTRICAL COMPONENTS
Martin L. Zelenz, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.
Filed Feb. 20, 1969, Ser. No. 801,115
Int. Cl. H01g 13/00
U.S. Cl. 29—25.42 8 Claims



Method and apparatus for forming thick-film electrical capacitors. Strips of electrically conducting and electrically

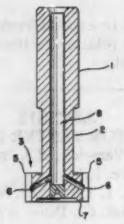
insulating material are fed in an overlapping manner to a cutting area. The strips are cut under sufficient pressure to form a bonded pair which is then transported to a remote position. Alignment between the bonded pair and a receptacle is achieved and the bonded pair is deposited therein. The cycle is repeated with the receptacle being rotated 180°. The rotation of the receptacle between cycles allows an interleaved capacitor of any desired size to be built up. When this is achieved, the receptacle may be removed to a die where sufficient pressure is applied to achieve adherence of all bonded pairs into a compact unit. This unit is then fired at selected temperatures to produce the capacitor.

3,597,817

TEE-SLOT CUTTER AND METHOD FOR USING IT

Howard M. Whalley, 6742 Stafford Drive, Mayfield Heights, Ohio

Filed Mar. 20, 1969, Ser. No. 808,866
Int. Cl. B26d *1/00, 1/12*
U.S. Cl. 29—106 **1 Claim**



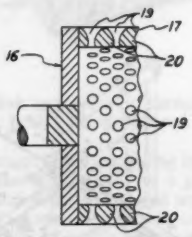
A tee-slot cutter for cutting T-shaped slots, as for example, in the metal table of a milling machine, at high speeds, without sacrificing tool life by providing liquid coolant through the openings near the hub of the cutting bit and away from the cutting edges, to direct liquid streams immediately in front of the cutting edges.

3,597,818

RECTIFIER ROLL

Ralph A. Beck, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 10, 1969, Ser. No. 815,121
Int. Cl. D21f *1/08*
U.S. Cl. 29—121 **3 Claims**



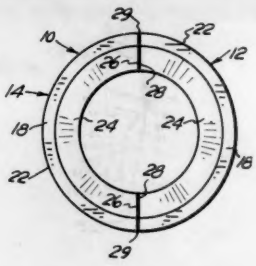
A tubular rectifier roll for use in a paper machine headbox is provided with tapered radial perforations of streamlined contour which impart essentially uniform and nonturbulent rectilinear flow to the paper stock emerging from the downstream side of the roll and entering the headbox slice, thereby insuring uniform deposition of the paper stock onto a paper-forming surface.

3,597,819

METHOD OF MAKING A COMPOSITE TAPERED ROLLER BEARING RACE

Hudson B. Scheifele, 30165 Ponds View Road, Franklin, Mich.

Filed Oct. 27, 1969, Ser. No. 870,681
Int. Cl. B23p *11/00;* **B21h** *1/12*
U.S. Cl. 29—148.4 R **9 Claims**



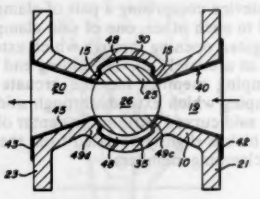
Suitable bearing race material is formed into bar stock having a longitudinally-oriented grain structure and having a cross section corresponding to the cross section of the prospective bearing race. From the thus-shaped bar stock are cut a plurality of pieces whose combined lengths substantially equal the circumferential length of the prospective bearing race. These pieces are then bent into circularly arcuate segments having curvatures corresponding to that of the prospective bearing race and having ends configured to fit one another. These segments are then aligned end-to-end in an annular path and welded together into an annular body which is then hardened and ground. This bar stock is provided with an inclined side surface which, for an outer race, becomes the inner surface of the segment, and for an inner race becomes the outer surface of the segment, in each instance constituting the roller path.

3,597,820

METHOD OF MAKING FULLY LINED VALVE

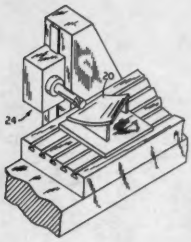
Robert C. Schenck, Jr., Dayton, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Division of Ser. No. 497,825, Oct. 19, 1965, Pat. No. 3,438,388.
This application Sept. 17, 1968, Ser. No. 760,292
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157.1 R **8 Claims**



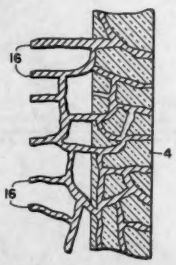
A corrosion resistant valve has a continuous polytetrafluoroethylene (PTFE) lining and includes a rotatable closure member. The valve body is lined by expanding an isostatically formed tubular element of PTFE, and maintaining the element expanded as it cools. In this way all interior surfaces of the body are covered with a corrosion resistant sheath. After formation of the lining, the bore is sized and the remaining components of the valve are assembled.

3,597,821
METHOD OF MAKING AN INTEGRATED MATCH MACHINING ROCKET NOZZLE
Herff C. Emerson, Chula Vista, Calif., assignor to Rohr Corporation
Division of Ser. No. 449,076, Apr. 19, 1965, Pat. No. 3,418,707.
This application Aug. 9, 1968, Ser. No. 766,007
Int. Cl. B23p 15/26
U.S. Cl. 29—157 2 Claims



A rocket nozzle shell-ablative liner composite is disclosed in which a large hot-sized, high-strength unitary nozzle is formed of annularly welded frustoconical ring sections of varying diameters and cone angles. Each of the ring sections is formed of arcuate ring segments welded together to form a unitary frustoconical ring section, and each ring segment is cut and contoured plate metal. The welded ring sections and unitary nozzle are hot sized to remove distortion, and the external surfaces of the resulting nozzle structure is only nominally machined to design configuration. The internal surface dimensions of the nozzle are measured numerically to receive a match-machined ablative liner which is bonded thereto. The liner has an inner layer of an ablative material and an outer layer of a resin impregnated fiber glass fabric which is machined to the inner dimensions of the nozzle shell.

3,597,822
METHOD OF MAKING FILAMENTARY METAL STRUCTURES
Francis P. Fehlner, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 426,181, Jan. 18, 1965, Pat. No. 3,407,125.
This application Feb. 15, 1968, Ser. No. 705,775
Int. Cl. B32b 15/02, 15/14
U.S. Cl. 29—183.5 1 Claim

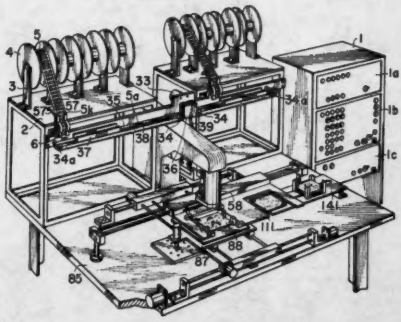


A composite body consisting of a filamentary dispersion of metal within the pores of a porous body, the individual filaments having a maximum thickness of less than 200 angstrom units. A cathode is applied to a portion of the external surface of a nonelectroconductive porous body and the exposed portion of the cathode as well as a portion of the porous body adjacent to the cathode are covered with a nonelectroconductive protective coating. Metal ions from the anode traverse the pores of the body and deposit on the cathode resulting in the growth of metallic filaments which extend from the cathode throughout at least a portion of the pores of the body.

3,597,823
PINCH-ON FISHING SINKER APPLIER AND ASSEMBLY
Averd G. Nelson, 6611 Wazeecha Ave, Wisconsin Rapids, Wis.
Filed Jan. 30, 1969, Ser. No. 795,309
Int. Cl. B23p 19/00
U.S. Cl. 29—200 B 10 Claims

A fisherman's sinker having a split opening is gripped in a hinged throwaway pincher having legs provided with flanges which hold the sinker in place. When a fisherman's line is placed in the split opening of the sinker, the pincher legs are pushed together to close the opening onto the line. The pincher may then be removed and thrown away.

3,597,824
FULL-AUTOMATIC ELECTRIC PART MOUNTING APPARATUS
Takekazu Yoshida, Fujiidera-shi; Yoshinobu Maeda, Kitakawachi-gun, Osaka, and Kazufumi Isomichi, Moriguchi-shi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 4, 1969, Ser. No. 847,329
Claims priority, application Japan, Aug. 10, 1968, May 9, 1969, Aug. 10, 1968, Mar. 19, 1969, 43/56791; 44/36841; 43/24743
Int. Cl. H01r ; B23q 7/10
U.S. Cl. 29—203 8 Claims



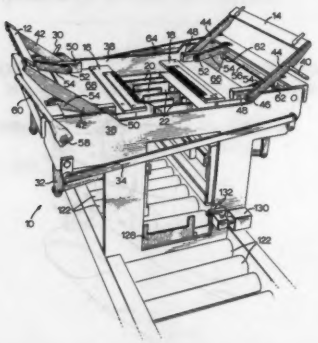
An apparatus for mounting electric parts, each having leads extending axially from the opposite ends thereof, on a printed substrate, by which the steps of chopping the leads, shaping the chopped leads, and inserting and fixing the shaped leads in the corresponding holes in said printed substrate are carried out automatically continuously.

3,597,825

BATTERY BURNING AND BOXING MACHINE

Karl Heinz Meislitzer, Winnipeg, Manitoba, Canada, assignor to Globelite Batteries Canada Limited, Scarborough, Ontario, Canada

Filed Nov. 24, 1969, Ser. No. 879,149
Int. Cl. H01m *35/18;* B23p *19/04*
U.S. Cl. 29—204 6 Claims



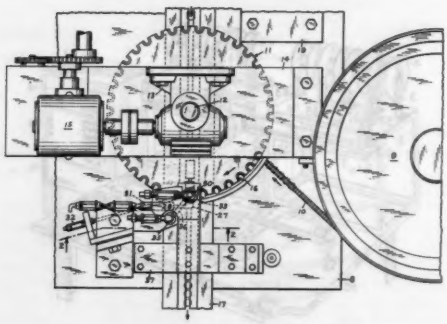
An apparatus for the assembly of lead-acid storage batteries wherein all of the plate groups are assembled into pockets in the upper part of the apparatus so that the dimensional relationships between the plate groups are as they will be when assembled into a battery box. Jig plates secure the groups of plate lugs so that they may be burned to form bus bars and also so that intercell connectors and battery posts may be assembled to the plate groups and burned simultaneously therewith. The then completely assembled electrical components of the battery are pushed downwardly into a waiting battery box to which only the electrolyte and battery cover need be added to have a completely assembled and operative lead-acid battery.

3,597,826

APPARATUS FOR UNITING A PLUNGER AND A PISTON OF A FULLY ASSEMBLED HYPODERMIC NEEDLE SYRINGE

Walter A. Shields, 38-09 24th St., Long Island City, N.Y.

Filed July 28, 1969, Ser. No. 845,419
Int. Cl. B23p *19/04;* B23g *7/10*
U.S. Cl. 29—208 B 9 Claims



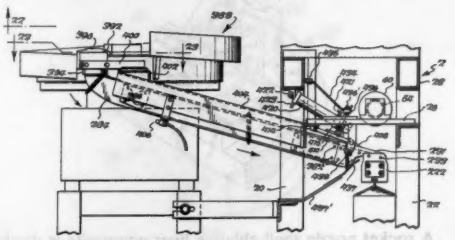
A plunger to actuate the piston of a fully assembled hypodermic needle syringe is united to said piston by moving the syringe longitudinally toward a stationary plunger to engage the piston with the plunger and rotating the syringe to unite the piston with the plunger. After the piston is united with the plunger, the syringe is lowered and removed from the apparatus.

3,597,827

AUTOMATIC HANDLE-APPLYING MACHINE

Carl J. Fries, Jr., Philadelphia; Leigh D. Leiter, Willow Grove, Pa., and Frank R. Linda, Fairfield, Conn., assignors to International Paper Company, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,420
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 B 10 Claims



An apparatus for feeding and securing a handle to the top of a gable-top container through a hole in the gable. A conveyor feeds each container to a receiving station. The handles, comprising a male member and a female member, are randomly oriented within a vibration hopper. A vibration feeder aligns the handles within the hopper and continuously positions a number of them on a slide beam. An applicator strips the leading handle from the slide beam and feeds it to a mandrel which is located at the receiving station. The mandrel spreads the handle and aligns the male member relative to the hole. The applicator inserts the male member through the hole in the gable of the container. The female member is automatically snapped over the end of the male member which protrudes through the hole to secure the handle to the container.

3,597,828

SNAP-RING TOOLS

James T. Clark, Fort Morgan, Colo., assignor to Clark-Fenther Manufacturing Co., Fort Morgan, Colo.

Filed July 24, 1969, Ser. No. 844,593
Int. Cl. B23p *19/04*
U.S. Cl. 29—229 5 Claims

An elongated tubular frame bar with a pistol grip handle at its outer extremity and fixed jaw projecting from its inner extremity. A movable jaw pivoted on said fixed jaw and extending forward in alignment with said fixed jaw, said jaws being provided with snapring-engaging pins. A handgrip lever pivotally mounted on said handle and a connecting rod connecting said handgrip lever with said movable jaw to actuate the latter.

3,597,829

METHOD OF MAKING A NICKEL HYDROXIDE ELECTRODE

Otto C. Wagner, Long Branch, and Martin J. Sulkes, Freehold, both of, N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 18, 1969, Ser. No. 808,353
Int. Cl. B22f 3/24
U.S. Cl. 29—420.5 4 Claims

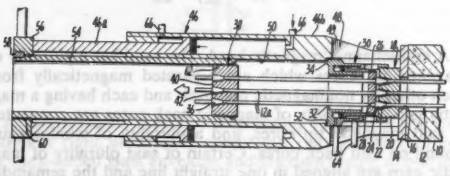
A nickel hydroxide electrode suitable for use in an alkaline nickel battery is made by pasting a solvent dispersion of nickel hydroxide onto a nickel foam matrix, drying the pasted matrix, pressing the dried pasted matrix to the required size, and attaching an electrically conductive tab to the electrode.

3,597,830

METHOD AND APPARATUS FOR POST TENSIONING AND ANCHORING PRESTRESSING TENDONS

Lawrence R. Yegge, 139 Via de Tesoros, Los Gatos, Calif.

Filed Nov. 29, 1968, Ser. No. 780,111
Int. Cl. B21d 39/00; E21b 19/00
U.S. Cl. 29—452 10 Claims



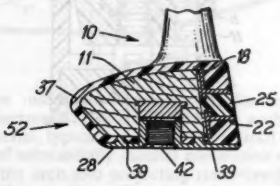
A method and apparatus for post tensioning a prestressing tendon disposed in a concrete structure through the employment of a first jack to impart a uniform predetermined tension to the tendon, and a second jack used in conjunction with an engageable anchor to selectively engage the anchor to the prestressing tendon and place he anchor in abutment with the concrete structure. The jacks are separate and separable from each other to facilitate preassembly of the second jack nd anchor on a tendon prior to the application of the first jack.

3,597,831

METHOD OF MANUFACTURING A GOLF CLUB

David Morton Caplan, Los Angeles, Calif., assignor to AMF Incorporated

Division of Ser. No. 602,691, Dec. 19, 1966, abandoned.
Filed July 7, 1969, Ser. No. 852,141
Int. Cl. B23p 3/00, 19/04
U.S. Cl. 29—460 5 Claims



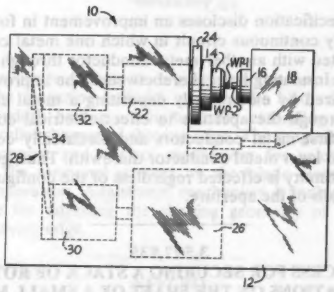
A golf club comprising a core having a soleplate register hole formed on the bottom portion thereof, a hosel hole formed on a side portion thereof and a cutaway section on the face portion thereof forming a rear face, a rear faceplate mounted within the cutaway portion, said rear faceplate including a base portion and a projecting portion consisting of two sidewalls and an apertured center portion extending outwardly from the base portion, a weight mounted within the soleplate register hole, a soleplate mounted to the bottom portion of the core, said soleplate having an apertured projecting portion extending outwardly therefrom to engage the soleplate register hole, a predetermined swing weight mounted within the apertured portion of the soleplate, and a shaft having one end portion mounted within the hosel hole of the core.

3,597,832

INERTIA WELDING OF STEEL TO ALUMINUM

Marion R. Calton, East Peoria, and Calvin D. Loyd, Peoria, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1969, Ser. No. 796,425
Int. Cl. B23k 27/00
U.S. Cl. 29—470.3 9 Claims



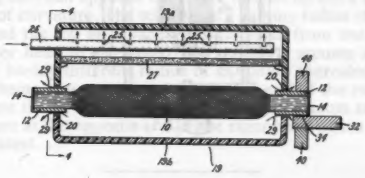
A process for inertia welding of steel to aluminum which may include the steps of cleaning and/or etching the parts, providing conical projections on the parts, providing a step load cycle wherein the final thrust load is high and close to the yield strength of the aluminum, utilizing moderately high speeds, the exercising close control of the alignment, amount of stickout, rigidity, and the triggering speed for the final load.

3,597,833

METHOD OF PERFORMING A BRAZING OPERATION ON TERMINAL STRUCTURE OF METAL BRAID

Oscar C. Frederick, and Albert C. Young, both of Springfield, Pa., assignors to General Electric Company

Filed Sept. 3, 1969, Ser. No. 854,913
Int. Cl. B23k 31/02
U.S. Cl. 29—479 14 Claims



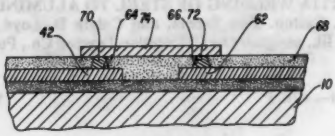
In this method, a tubular end ferrule is placed about the end of a short length of metal braid, and this assembly is placed in a chamber with the ferrule projecting through a hole in the chamber wall. A flow of nonoxidizing gas, such as nitrogen, is introduced into the chamber to form a blanket of nonoxidizing gas around the braid. While this blanket is present, heat is applied to the ferrule portion outside the chamber as part of a brazing operation that raises the temperature of the ferrule and the braid to a high level. After such heating, liquid nitrogen is introduced into the chamber to rapidly cool the braid and the ferrule.

3,597,834

METHOD IN FORMING ELECTRICALLY CONTINUOUS CIRCUIT THROUGH INSULATING LAYER

Jay W. Lathrop, Dallas; Robert S. Clark, Dallas, and Sam J. Wood, Jr., Richardson, all of, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 14, 1968, Ser. No. 705,502
Int. Cl. B41m 3/08; B01j 17/00
U.S. Cl. 29—576 R 6 Claims



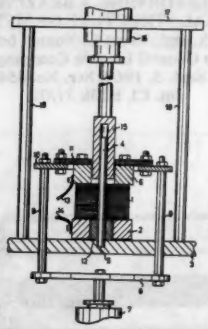
This specification discloses an improvement in forming an electrically continuous circuit in which one metal conductor is connected with another metal conductor through an aperture in an insulating layer therebetween. The improvement is characterized by electrolessly depositing a metal conductor in and through the aperture to effect electrical connection with the first metal conductors and electrically connecting the second layer metal conductor therewith. Thus, good electrical continuity is effected regardless of the configuration of the sidewalls of the aperture.

3,597,835

PROCESS FOR SECURING A STACK OF ROTOR LAMINATIONS ON THE SHAFT OF A SMALL MOTOR

Claude Scaillet, Uccle, and Rene Romant, Saint-Servais, both of, Belgium, assignors to Ateliers De Constructions Electriques De Charleroi (ACEC) Societe Anonyme, Charleroi, Belgium

Filed Dec. 3, 1968, Ser. No. 780,846
Claims priority, application Belgium, Dec. 20, 1967, 52,362
Int. Cl. H02k 15/02
U.S. Cl. 29—598 1 Claim



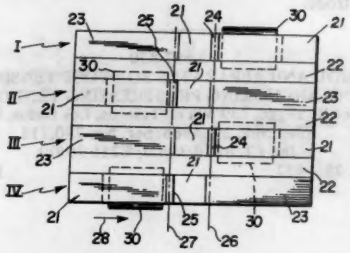
The disclosure relates to a process for securing a stack of rotor laminations on the shaft of a small motor. The binding of the laminations on the shaft is effected by inserting a shaft having a smooth surface into a stack of laminations, each lamination having a central bore and a dished portion around such bore, by applying to the stack of laminations in the region remote from the central bore a predetermined pressure, by heating at a predetermined temperature in a very short time interval the stack of laminations, and by applying a high pressure to the stack of laminations in the region of the central bore to compress the dished portion of the laminations and so produce a binding of the laminations on the shaft.

3,597,836

METHOD OF MANUFACTURING A MULTICHANNEL MAGNETIC HEAD

Takashi Tanaka, Osaka, and Yasuo Nomura, Hyogo, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 8, 1969, Ser. No. 822,926
Claims priority, application Japan, May 21, 1968, May 21, 1968, May 22, 1968, Oct. 12, 1968, Dec. 2, 1968, 43/43015; 43/43016; 43/43065; 43/74786; 43/105714
Int. Cl. H01f 7/06
U.S. Cl. 29—603 1 Claim



A multichannel magnetic head. The head has a plurality of magnetic tip cores which are separated magnetically from each other by nonmagnetic materials and each having a magnetic gap. A plurality of magnetic back cores are connected to said magnetic tip cores, and a plurality of windings are wound on said back cores. Certain of said plurality of magnetic gaps are aligned in one straight line and the remainder are aligned in another straight line. The two straight lines are perpendicular to the direction of tape movement of a recording and reproducing device.

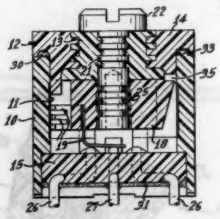
A method of making the multichannel head is to provide a magnetic plate and adhere to it stacks of alternating magnetic material and nonmagnetic material blocks. Thereafter, slots are cut at the joints between the blocks and nonmagnetic plates inserted in the slots. The resulting assembly is trimmed appropriately and back cores are attached to it and connected to the tip cores.

3,597,837

METHOD OF MAKING TRIMMER POTENTIOMETERS

Walter Mack, Elmhurst, N.Y., assignor to Litton Precision Products, Inc., Mt. Vernon, N.Y.

Filed Nov. 12, 1968, Ser. No. 774,682
Int. Cl. H01c 17/00
U.S. Cl. 29—610 4 Claims



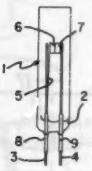
A potentiometer or variable resistor adapted to be fabricated in subminiature size, and the method of making the same. The potentiometer or resistor comprises a top assembly and bottom header, and an insulating shell or casing. The top plate assembly is comolded with a plastic bearing member for the adjustable shaft carrying the contact brush or wiper. The top plate is also comolded with the insulating brush block on the adjustable shaft. A plastic sleeve is positioned between the brush block and the adjusting shaft to

secure the block in place, provide a friction-clutch drive for turning the brush block and contact wiper which will slip if the shaft is turned after the block strikes the stop at the end of its travel, and act as a cushion between the metallic shaft and the molded block when the potentiometer is subjected to relatively large temperature changes. Terminals are provided, in the bottom header, for the contact wiper and resistance element. The resistance element may be of any suitable type, such as wire-wound, carbon film, thick metal or metal oxide film or thin metal or metal oxide film.

3,597,838
METHOD OF MAKING A HERMETICALLY SEALED CIRCUIT BREAKER

Philip Dennis, Lynn, Mass., assignor to Sylvania Electric Products, Inc.

Filed Oct. 1, 1968, Ser. No. 764,127
Int. Cl. H01h *11/00*
U.S. Cl. 29—624 **7 Claims**

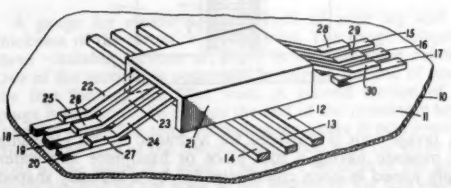


A thermostatic, metallic, snap-acting element and a substantially rigid, electrically conductive post are inserted into an open-ended glass envelope and are then sealed to one end thereof, the element and post being in normal electrical contact. The assembly is then heated to a predetermined temperature and, if the element snaps open, the post is physically displaced to prevent opening thereof at that temperature. The process is repeated at a higher predetermined temperature to ensure opening at the higher temperature. The envelope is then tubulated, filled and sealed.

3,597,839
CIRCUIT INTERCONNECTION METHOD FOR MICROELECTRONIC CIRCUITRY

Ralph J. Jaccodine, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 10, 1969, Ser. No. 805,668
Int. Cl. H05k *3/30*
U.S. Cl. 29—626 **2 Claims**

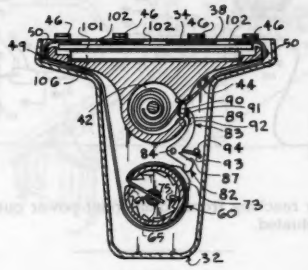


A crossover interconnection element for integrated or other microelectronic circuits comprises an arch member of dielectric material, typically ceramic or oxidized silicon, having an array of substantially parallel conductive strips on the underside of the arch and projecting transversely therefrom as self-supporting members. The eight of the arched member and the thickness of the conductive strips are such as to provide clearance, and therefore electrical isolation, between the strips and a conductive pattern on an integrated circuit so that the arched member can be placed on the circuit with the conductive strips transversely disposed and bridging the conductors on the integrated circuit and the projecting terminal portions of the strips are then bonded to conductive members on the circuit board.

3,597,840
SAFETY RAZOR

Oliver C. Forehand, Box 428, Sylvester, Ga.

Filed Apr. 25, 1969, Ser. No. 819,207
Int. Cl. B26b *21/26*
U.S. Cl. 30—40.1 **8 Claims**

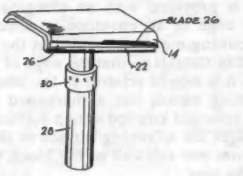


This invention relates to a magazine for use in a safety razor. The magazine includes a ribbonlike blade element of uniform width having a longitudinally extending rear edge and a parallel sharpened shaving edge. The magazine also includes support and control mechanism for selectively increasing the tensional stresses on the blade element for a shaving operation. Adjustment mechanism is included in the magazine for adjusting the shaving geometry of the sharpened shaving edge.

3,597,841
SAFETY RAZOR

Benjamin Miller, 1102 Leland Ave., Bronx, N.Y.

Filed June 11, 1969, Ser. No. 832,104
Int. Cl. B26b *21/18*
U.S. Cl. 30—72 **4 Claims**



A safety razor in which top and bottom cooperating pressure members between which the razor blade is gripped have cooperating outwardly and downwardly extending lips extending between opposite ends. The bottom lip has a uniform radius of curvature. The top lip has a varying radius of curvature, and the top lip is tapered in its width from one end of the razor head to the other. The top lip is arcuate in cross section having different radius of curvature therealong, said radius being at a maximum value at the end of the razor top lip where the lip is narrowest, and having maximum radius of curvature at the opposite end of the razor head where the top lip is widest.

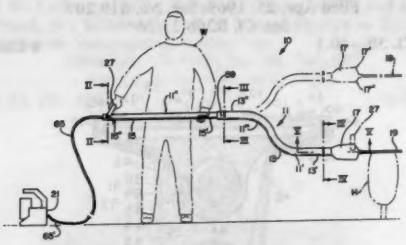
3,597,842
PORTABLE CLIPPER APPARATUS

Edmund G. Greene, 1314 Singing Tree, Memphis, Tenn.

Filed Oct. 27, 1969, Ser. No. 869,661
Int. Cl. B26b *19/02*
U.S. Cl. 30—198 **6 Claims**

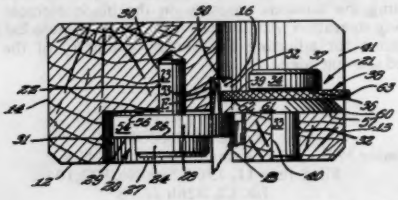
Portable clipper apparatus including an elongated handle for use in combination with a conventional reciprocating hedge trimmer for extending the reach thereof which simplifies trimming wide beds of formal hedgelike growth prevalently used artistically in the art of landscape architecture and for use in nurseries. Also included in the apparatus

is a conventional portable generator which provides electrical power for operating the hedge trimmer at locations that



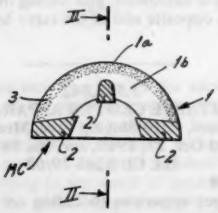
may be far reaching from commercial power outlets and/or remotely situated.

3,597,843
DEVICE FOR OPENING ENVELOPES
John S. Kettlestrings, 216 N. Knollwood Drive, Wheaton, Ill.
Filed Mar. 21, 1969, Ser. No. 809,220
Int. Cl. B26b *27/00*
U.S. Cl. 30—265 **2 Claims**



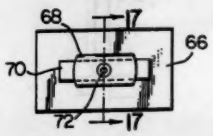
A generally rectangular block sized to beheld in the hands of a user is provided with an elongate guide slot through which the edge of an envelope is directed and a two-part rotatable cutting means journaled in the block has a cutting nip formed in the slot so that the edge of the envelope will be severed as it is moved relative to the block. One of the parts of the cutting means has a sharpened cutting edge and a somewhat enlarged knurled action surface which not only actively engages the adjoining surface of the envelope but also projects from one sidewall of the block to facilitate manipulation by the user.

3,597,844
MOVABLE CUTTER FOR SHAVING APPARATUS
Werner Messinger, Kronberg, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Apr. 24, 1969, Ser. No. 819,050
Claims priority, application Germany, May 2, 1968, P 17 03 530.5
Int. Cl. B26b *19/06*
U.S. Cl. 30—346.51 **8 Claims**



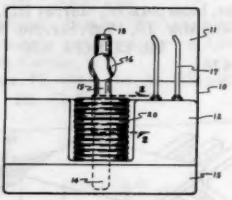
The reciprocable cutter of a dry shaver has substantially semicircular blades whose convex outer surfaces are adjacent to the inner side of the comb foil and whose side surfaces are provided with strips of diamond dust, sapphire dust or other finely comminuted granular material having a hardness which is considerably higher than the hardness of the ferrous or synthetic plastic material of the blades. The width of such strips is in the range of 1 millimeter and the granulae impart to the adjoining cutting edges of the blades an irregular (substantially undulate) shape to insure more reliable engagement between the cutting edges and the whiskers or hairs which penetrate through the apertures of the foil into the range of reciprocating blades. The outer surfaces of the blades are polished to a high degree of smoothness subsequent to application of granulae.

3,597,845
ORTHODONTIC APPLIANCE
Patrick C. Russ, 4319 Drury Lane, Fort Wayne, Ind.
Division of Ser. No. 614,654, Feb. 8, 1967, Pat. No. 3,469,315.
Filed Apr. 4, 1969, Ser. No. 813,422
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **7 Claims**



An orthodontic appliance comprising means for securing detachably an arch wire to a tooth, including a retainer which slidably receives an elongated hollow receptacle, an arch wire received by said receptacle, and means securing said retainer, said receptacle and said arch wire together.

3,597,846
ORAL LAVAGE UNIT
Reinhold M. Weiss, Chicago, Ill., assignor to Parke, Davis & Company, Detroit, Mich.
Filed May 12, 1969, Ser. No. 823,731
Int. Cl. A61c *19/02*
U.S. Cl. 32—22 **4 Claims**

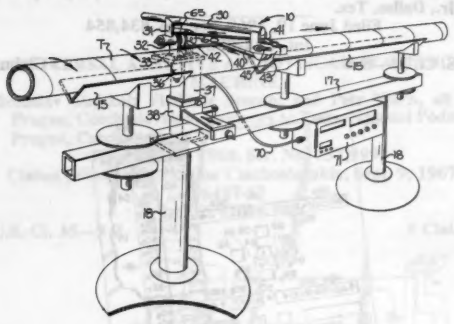


A lavage unit is provided for hydraulic dental cleansing and massage having a tool piece or handpiece and water supply joined in open communication by a helically shaped length of flexible hose. For storage purposes the unit includes a pedestal for axially mounting the tool piece and for holding the hose in a stack of coils matching and surrounding outer walls of the pedestal.

3,597,847
APPARATUS AND METHOD FOR MEASURING A COMPONENT OF TRAVEL OF A AXIALLY ADVANCING AND ROTATING TUBE
Clarence W. Anderson, Cheraw, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Aug. 19, 1969, Ser. No. 851,342
Int. Cl. G01b *3/12, 5/04*
U.S. Cl. 33—142 **16 Claims**

A surface contacting device is applied to a rotating and axially advancing tube to measure the angular direction of

travel of the surface and the length of travel of a point on the surface in its generally helical path or its axial or its rotary component, or all of them. A freely pivotable arm extending over the tube carries an endless belt which engages the moving surface and is swiveled thereby into the direction of the



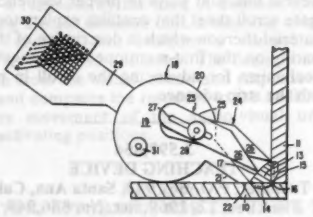
surface travel. A sphere and disc type of resolver at one of the belt pulleys provides for picking off the selected component or the resultant travel, and a pulse generator driven thereby transmits to a counter where the length of travel is indicated.

3,597,848

WELD GAUGE

Paul E. Matson, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 23, 1969, Ser. No. 827,222
Int. Cl. G01b 5/02
U.S. Cl. 33—169 D 2 Claims



A gauge for measuring the length of each leg and the thickness of the throat of a fillet weld. The gauge comprises three rotatable sections arranged in superimposed relation. One of the sections is positioned to engage the end of one of the legs forming the fillet weld. A second section of the gauge is positioned to engage the end of the remaining leg of the fillet weld. The third section of the gauge is positioned to contact the face of the throat. Associated with the three sections of the gauge is a scale. The three sections of the gauge age positioned on the scale so the lengths of the legs and the thickness of the throat portion of the weld may be obtained.

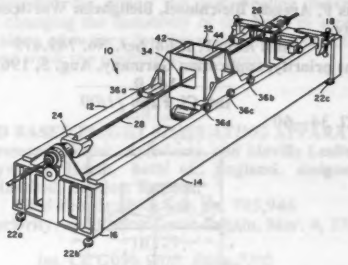
3,597,849

PERIPHERAL SCANNING SYSTEM

Andrew E. Gaal, Monroeville, Pa., assignor to The United States of America as represented by the United States Atomic Energy Commission.

Filed Aug. 12, 1969, Ser. No. 849,420
Int. Cl. G01b 5/20
U.S. Cl. 33—174 PB 4 Claims

A peripheral scanning system for measuring the surface shape of a rod. A pair of needlelike probes are maintained in contact with the outer surface of the rod while a mechanism is employed to maintain contact with the probes as the latter are moved transversely. Thus the probes are forced to retract to accommodate changes in surface shape. Transducers are utilized to report the positions of the probes continuously. A



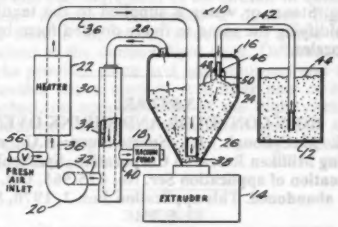
swing arm arrangement interconnects the probes for simultaneous movement.

3,597,850

CONTINUOUS VACUUM DRIER

John W. Jenkins, Clayton County, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Continuation-in-part of application Ser. No. 706,965, Feb. 20, 1968, now abandoned. This application Mar. 11, 1970, Ser. No. 18,618
Int. Cl. F26b 3/08, 17/00
U.S. Cl. 34—10 17 Claims



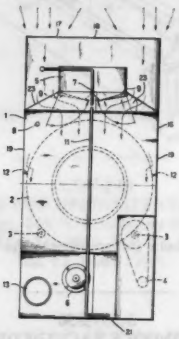
A continuous vacuum drier for removing moisture from solid synthetic resins in granular form prior to manufacturing into finished products. The synthetic resinous material is continuously supplied to the top of a closed drying hopper and removed from the bottom of the hopper. In one embodiment air withdrawn from the top of the hopper is circulated through a heater and is returned to the bottom of the hopper, where it travels upwardly through the synthetic resinous material in the hopper. In a second embodiment, air is withdrawn from the bottom of the hopper and is returned to the top of the hopper, where it travels downwardly through the synthetic resinous material in the hopper. The circulated air and the material in the hopper are heated as they pass grids of pipes which are heated by circulated hot water. In both embodiments, a vacuum pump is connected to reduce the air pressure in the system for increasing the efficiency of the drier and for causing the hopper to automatically fill with material to a predetermined level from a primary feeder hopper. A small amount of dry air may be introduced into the hopper for carrying off evaporated moisture. The dry material is fed by gravity from the bottom of the hopper to a processor.

3,597,851

ROTATING APPARATUS FAN SUBJECTING TEXTILE MATERIALS TO A SHRINKAGE-REDUCING TREATMENT

Hans Fritz Arendt, Bietigheim, Wurttemberg, and Berthold Magin, Kleinsachsenheim, both of, Germany, assignors to Hans F. Arendt, Bleichinsel, Bietigheim Wurttemberg, Germany

Filed Aug. 1, 1968, Ser. No. 749,479
Claims priority, application Germany, Aug. 5, 1967, P 16 35 141.0
Int. Cl. F26b *11/00*
U.S. Cl. 34—60 1 Claim



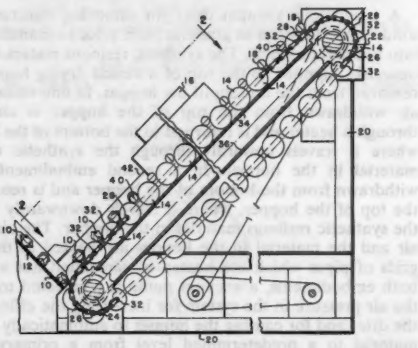
The residual shrinkage of textile materials of limited length is reduced to about ± 2 percent and less by tumbling the textile materials in a drumlike apparatus rotating at a predetermined speed in a closed chamber. Natural fibers become crimped during tumbling by alternately humidifying and drying the textiles; or synthetic fibers become thermofixed by exposing the textiles to hot air at a temperature above 110° C. during tumbling. The direction of rotation of the apparatus may be repeatedly reversed during crimping or thermofixing. Steam or water is supplied to the textile material for humidifying the same in finely divided form by means of spray nozzles.

3,597,852

COIN CONVEYOR AND SHRINK OVEN

John K. McCollough, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of application Ser. No. 675,565, Oct. 16, 1967, now abandoned. This application Jan. 2, 1970, Ser. No. 5,388
Int. Cl. B65b *11/04*
U.S. Cl. 34—218 3 Claims



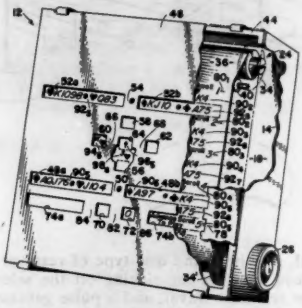
This application discloses a method and apparatus to efficiently convey and shrink a pillow package around a roll of coins in a shrink oven. Basically a plurality of rollers are rotatably connected to an endless chain and the roll of coins is dropped into the conveyor between a pair of rollers and is constantly rotated by the rollers to orient the coins and allow even shrinkage of the film on all sides of the package.

3,597,853

CONTRACT BRIDGE SIMULATOR

George F. Kucera, Palo Alto, Calif., assignor to Ira G. Corn, Jr., Dallas, Tex.

Filed June 19, 1969, Ser. No. 834,854
Int. Cl. G09b *19/22*
U.S. Cl. 35—8 B 13 Claims



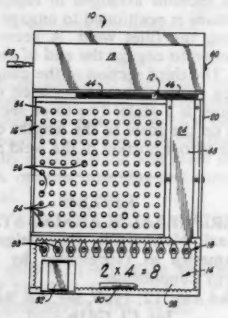
An elongate indicia bearing strip having preprogrammed indicia thereon for guiding the user through the bidding and playing procedures of a bridge hand. A mechanism for supporting the strip so that the strip can be positioned and advanced as bidding and playing proceed. The mechanism includes interchangeable opaque plates having openings therein that are positioned so as to reveal to the user indicia corresponding to the bidding and playing steps in proper sequence. A rotatable disc that has openings therein proportioned to reveal bids and plays in proper sequence. An auxiliary elongate scroll sheet that contains explanatory and educational material thereon which is descriptive of the bids and plays appearing on the first-mentioned strip together with a support mechanism for advancing the scroll in proper correlation with the strip advance.

3,597,854

TEACHING DEVICE

Edwina P. Trimmer, P.O. Box 922, Santa Ana, Calif.

Filed Dec. 22, 1969, Ser. No. 886,949
Int. Cl. G09b *3/00*
U.S. Cl. 35—8 R 7 Claims



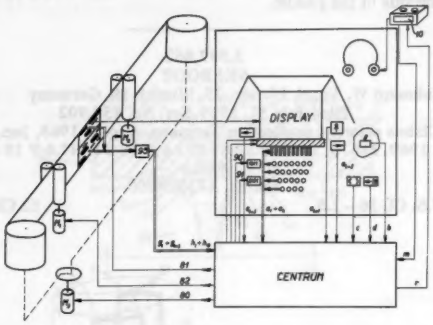
This invention is an apparatus to aid in the teaching of mathematics to children. It has a closed boxlike housing with a window to display the problems which are written on a sheet and attached to a roller mounted within the housing.

The housing also has on its surface a member with a plurality of holes therein and pegs therefore and a member with a surface to receive indicia thereon for the student to formulate the problem's answer. The apparatus has a plurality of indicators to be operated by the student upon correctly answering each problem, and a senses-indicating system operable upon proper manipulation of the indicators.

3,597,855
UNIVERSAL ADAPTIVE AUDIOVISUAL TEACHING MACHINE

Bretislav Stejskal; Vladimir Stepan, and Petr Vlach, all of Prague, Czechoslovakia, assignors to Tesla, Narodni Podnik, Prague, Czechoslovakia

Filed Sept. 6, 1968, Ser. No. 757,999
Claims priority, application Czechoslovakia, Sept. 9, 1967, 6457-67
Int. Cl. G09b *7/04*
U.S. Cl. 35—9 R **9 Claims**

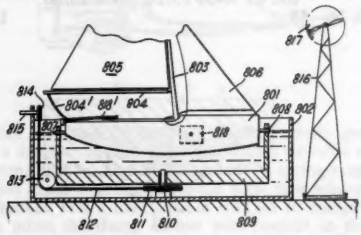


A universal adaptive audiovisual teaching device having visual display means, sound reproducing means and input means for a response by the user. A decision system is provided having a basic decision unit, a stepping unit and timing unit. The decision unit includes a control memory, a peripheral memory and a selector. The decision unit receives information from the visual, sound and response input units, evaluates and compares the response to the audio-visual units and directs movement of the audio-visual units to appropriate activating positions.

3,597,856
SIMULATING APPARATUS FOR TEACHING THE ART OF SAILING

Rogor Strange Waddington, deceased, late of Lausanne, Switzerland; Bruce Duval, Lausanne, Switzerland, and David Buckley Sharp and Joan Stanley Rubinstein, executors, London, England (of said Rogor Strange Waddington, deceased), assignors to T.P.I. Limited, Nassau, Bahamas

Continuation-in-part of application Ser. No. 775,559, Nov. 13, 1968, now Patent No. 3,471,943. This application July 8, 1969, Ser. No. 840,611
Int. Cl. G09b *9/06*
U.S. Cl. 35—11 **6 Claims**

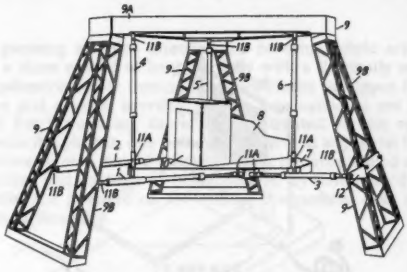


The invention provides a simulator for teaching the art of sailing on dry land. A hull mounted for change of heading upon mechanical bearings or upon a tank of water has a helm, a boom and a mainsheet. Operation of the boom and mainsheet causes the hull to change its heading as in actual sailing upon water. The hull is preferably mounted to permit heeling. Heeling motion may be produced mechanically or by the action of an airstream upon a sail. Automatic devices may be provided for giving the hull heeling movements and/or for changing the sensitivity of the helm in a realistic manner making allowance for the strength and direction of the supposed wind, the position of the boom, etc.

3,597,857
GROUND BASED FLIGHT SIMULATING APPARATUS

William Desmond Akister, Aylesbury, and Meville Leslie Shelley, Haywards Heath, both of, England, assignors to Redifon Limited, London, England

Filed Feb. 3, 1969, Ser. No. 795,946
Claims priority, application Great Britain, Mar. 4, 1968, 10279
Int. Cl. G09b *9/08;* **B64g** *7/00*
U.S. Cl. 35—12 **13 Claims**

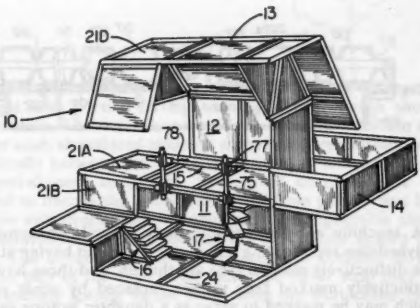


In ground-based flight-simulating apparatus, a dummy flight deck is provided for the crew being trained and the dummy flight deck, with occupants, is moved to simulate at least pitch and roll movement of an aircraft in actual flight. The present invention comprises a dummy flight deck suspended from a supporting structure by three hydraulic jacks attached to the dummy flight deck. Differential action of the jacks provides pitch and bank motions and common action provides heave motion. A further pair of hydraulic jacks attached, on opposite sides of the flight deck centerline, provides yaw, surge and retardation motions. A further hydraulic jack, acting transversely of the flight deck centerline, provides sway motion.

3,597,858
SCALE BUILDING SET AND ELEMENTS

Charles S. Ogsbury, Gold Hill, and Don C. Witte, Salina Star Rte., Boulder, both of, Colo.

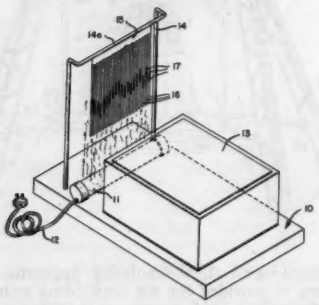
Filed Nov. 27, 1968, Ser. No. 779,379
Int. Cl. G09b *25/04*
U.S. Cl. 35—16 **9 Claims**



In a scale building set there is provided a plurality of building elements dimensionally related to conform to a selected

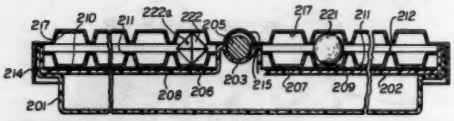
scale having interlocking socket and beaded joint portions which may be assembled into a wide variety of composite structures including scale model buildings. The socket joint portion is slotted for insertion of the beaded joint portion and firmly grips the beaded joint portion to hold the elements in particular angular relation while at the same time permitting substantial forced rotational and sliding movement between elements. One of the elements is a flat panel which may be of a variety of geometric shapes and another of the elements is a connector of preselected lengths having plural joint portions arranged in angular spaced relation to one another about a common midpoint.

3,597,859
APPARATUS AND METHODS OF VISUAL DEMONSTRATION OF SOUND WAVE MOTION
Kenneth G. Salem, 226 Belmont St., Johnstown, Pa.
Continuation-in-part of application Ser. No. 775,874, Nov. 14, 1968. This application Aug. 26, 1969, Ser. No. 853,088
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 R **4 Claims**



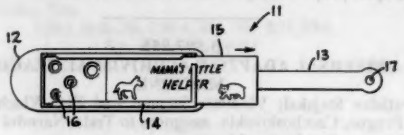
An apparatus is provided for visually demonstrating sound wave motion in the form of a plurality of side-by-side reflective strips suspended vertically from one end, a source of moving fluid acting continuously on said strips and an indicating means normally reflected from the strips intermediate their ends.

3,597,860
TEACHING AID
Achille Capecelatro, 153 Woodland Road, Madison, N.J.
Filed Oct. 6, 1969, Ser. No. 864,085
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 R **6 Claims**



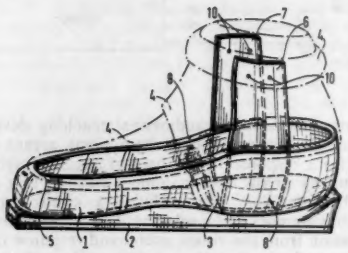
A teaching aid for teaching decay-growth phenomenon. Polyhedrons representing a parent isotope and having at least one distinctively marked face are thrown, and those having a distinctively marked face up are replaced by other pieces which may be marked to serve as a daughter isotope or may be unmarked to serve as the stable atoms. Data is taken after each throw and replacement, and plotted, whereby decay-growth curves are obtained. A throwing tray with a nested storage tray are provided for containing the polyhedrons.

3,597,861
EDUCATIONAL DEVICE
Dewey J. Gordon, 120 Happy Acres Road, Los Gatos, Calif.
Filed May 20, 1969, Ser. No. 826,122
Int. Cl. G09b *19/00;* **G09f** *3/20;* **A63b** *59/00*
U.S. Cl. 35—22 R **4 Claims**



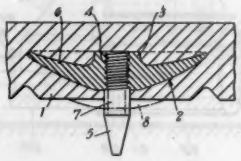
Disclosed herein is a paddle having a plurality of apertures through the main body portion of the paddle and a sign-holding frame disposed about the perimeter of said apertures on one side of the paddle.

3,597,862
SKI BOOT
Raimund W. Vogel, Lierstr. 25, Munich 19, Germany
Filed July 31, 1969, Ser. No. 858,902
Claims priority, application Germany, Aug. 1, 1968, Jan. 31, 1969, Feb. 6, 1969, P 17 85 023.6;P 19 04 847.6;P 19 05 980.4
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 **12 Claims**



A plastic ski boot is provided with lateral reinforcing means in the ankle region, an elastic cuff connected with the reinforcing means, and with a waterproof bat tongue which makes possible a wide opening of the boot and closing of the boot so as to facilitate removal of the boot from the mold in production.

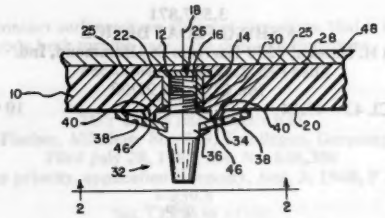
3,597,863
SPORTS SHOES
Marcus Luther Austin, 53, Park Avenue, and Clive Jonathan Austin, 1, Balmoral Avenue, both of Bedford, Bedfordshire, England
Filed Feb. 24, 1969, Ser. No. 801,509
Claims priority, application Great Britain, Feb. 26, 1968, 9173/68
Int. Cl. A43b *23/28;* **A43c** *15/00*
U.S. Cl. 36—59 **13 Claims**



A shoe, such as a golf shoe having a molded sole embodying a plurality of preformed molded members of higher

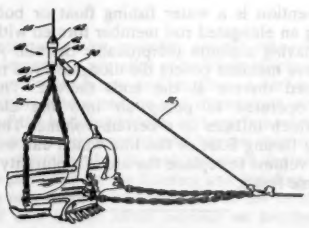
mechanical strength than the main sole body each molded member comprising a receptacle portion for removably securing a spike, and an integral plate portion sandwiched within the thickness of the sole and performing the function of distributing ground pressure on a spike secured in the receptacle over a large area of the sole, the molded members being embodied in the sole as individual units or as a multiple unit or multiple units of interconnected preformed molded members.

3,597,864
SHOE SOLE AND HEEL STRUCTURE
Arden B. MacNeill, Sudbury, Mass., assignor to MacNeill Engineering Company, Inc., Waltham, Mass. and Walter J. Kreske, Newton Centre, Mass., part interest to each
Continuation of application Ser. No. 848,442, Aug. 8, 1969, now abandoned. This application June 3, 1970, Ser. No. 41,752
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **8 Claims**



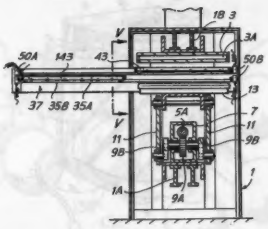
A molded shoe sole or heel having imbedded therein a receptacle with a threaded sleeve for receiving a threaded stem of a spike, such as a golf shoe spike, loggers boot spike, track shoe spike and the like, of the type having a laterally projecting flange which presses against a sealing ridge on the bottom surface of the shoe sole to thereby form with the spike a leaktight seal about the spike receptacle.

3,597,865
ATTITUDE ADJUSTER FOR DRAGLINE BUCKET
Henry Rumfelt, 300 N. Grove Ave., Oak Park, Ill.
Filed Apr. 15, 1969, Ser. No. 816,303
Int. Cl. E02f *3/44*
U.S. Cl. 37—135 **3 Claims**



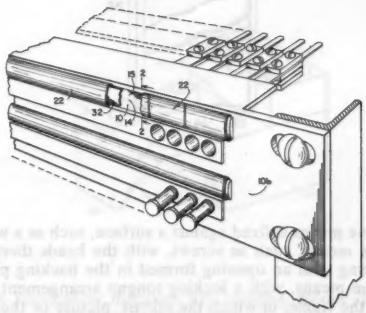
A device for insertion between the hoist rope and hoist chain of a dragline bucket which provides a movable support for the dump sheave. The device includes a spring suspension of the hoist chain with respect to the hoist rope whereby lifting the bucket with a load therein will act to compress the spring to move the dump sheave with respect to the hoist trunnions, thereby increasing the moment arm of the off-center weight on the dump rope to reduce the amount of force necessary to lift the bucket while maintaining proper bucket attitude to prevent premature dumping.

3,597,866
PRESSING MACHINES
Riccardo Bettarini, Localita Piazzano Empoli, and Gino Pacini, Piazza Paisiello 7, both of Empoli, Florence, Italy
Filed Jan. 9, 1970, Ser. No. 1,790
Claims priority, application Italy, Jan. 11, 1969, 4,411 A/69
Int. Cl. D06f *71/00, 71/38*
U.S. Cl. 38—28 **1 Claim**



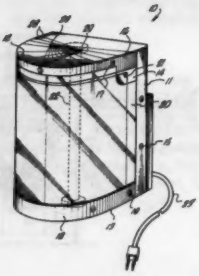
A pressing machine intended for covering fabric articles with a sheet coated at least partially with a thermally sensitive adhesive or for ironing fabrics includes an upper fixed platen and a lower movable platen. Two carriages are provided for introducing fabrics to be treated to the space between the platens, one being inoperative at any given time. The lower platen carries a flexible sheet member sealed at its periphery and capable of being inflated by compressed air, whereby the pressure on the articles is equalized over their whole surface area.

3,597,867
DESIGNATION STRIP ASSEMBLY
James R. Bailey, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.
Filed June 13, 1969, Ser. No. 833,038
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 R **10 Claims**



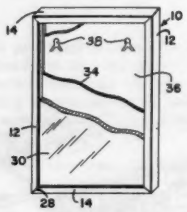
A designation strip assembly comprises an elongated straight base portion having an outer face between shouldered sides. The outer face may have a concave portion adjacent each shouldered side and a gently convex surface longitudinally between the concave portions. A self-supporting, channel-shaped, springable, transparent cover strip is attached to overlie the outer face of the base portion and has flanges with beaded locking edge portions engageable along the shouldered sides for locking the cover strip against the base. The cover strip web curves gently to conform to the convex part of the base outer face. The cover strip may be progressively sprung to the base along the shouldered base sides and may be progressively removed by springing therefrom. An indicia bearing designation strip is normally carried along the inside face of the cover strip and is wide enough to be retained between the flanges of the cover strip.

3,597,868
CONVEX SCREEN VIEWBOX
James A. Tamborello, North Hollywood, Calif., assignor to Osamu Miyamoto, Arcada, Calif., a part interest
Filed Mar. 18, 1969, Ser. No. 808,096
Int. Cl. G09f 13/10
U.S. Cl. 40—106.1 10 Claims



The invention disclosed herein describes a viewbox having a curvilinear screen for receiving a panoramic radiograph in order to illustrate the anatomical structure depicted on the radiograph in its natural position.

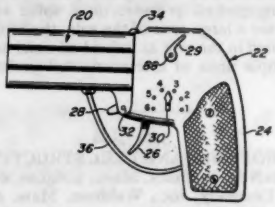
3,597,869
THEFTPROOF INSTALLATION FOR FRAMED MIRRORS, PICTURES AND THE LIKE
Donald R. Ruyle, 2901 Holliday St., Wichita Falls, Tex.
Filed July 7, 1969, Ser. No. 839,269
Int. Cl. G09f 1/12
U.S. Cl. 40—152.1 7 Claims



A frame means is fixed against a surface, such as a wall, by fastening means, such as screws, with the heads thereof interengaging with an opening formed in the backing plate of the frame means, with a locking tongue arrangement which permits the frame, in which the mirror, picture or the like is mounted, to be moved into a permanently locked position on the heads of a plurality of screws or projections in such manner that the mirror or picture frame cannot be removed without the destruction thereof. The present arrangement is particularly adaptable for use in restrooms, hotels and the like for the mounting of mirrors, pictures and the like.

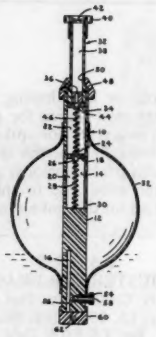
3,597,870
MULTIPLE-BARREL HAND WEAPON WITH SELECTIVE BARREL DISCHARGE CAPABILITY
Myron J. Block, Nahant, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.
Filed June 25, 1969, Ser. No. 836,279
Int. Cl. F41c 19/00
U.S. Cl. 42—42 R 2 Claims

A multiple-barrel hand weapon with selective barrel discharge capability containing a like number of cartridges and having a selectively adjustable arming mechanism so that a shooter can fire each cartridge individually by successive



actuations of the trigger or, alternatively, can fire groups of cartridges simultaneously upon successive actuations of the trigger.

3,597,871
FISHING FLOAT DEVICE
Ralph H. Hansen, 7230 Harrison St., Hammond, Ind.
Filed Feb. 2, 1970, Ser. No. 7,558
Int. Cl. A01k 93/00
U.S. Cl. 43—43.14 10 Claims

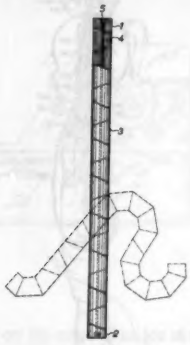


This invention is a water fishing float or bobber device comprising an elongated rod member formed with a cylinder chamber having a piston reciprocable therein. A resiliently elastic sleeve member covers the elongated rod member and is connected thereto at the ends thereof. The piston is manually operated to pump air into the elastic sleeve member which inflates to a certain volume. This invention serves as a fishing float or the like which can be inflated to any select volume to replace the use of a plurality of different fixed volume floats.

3,597,872
TOY COMPOSED OF A PLURALITY OF BODIES HELD IN END-TO-END RELATION BY AN ELASTIC MEMBER
Jorma Vennola, Luoteisuayla 17 B, Helsinki 20, and Pekka Korpijaakko, Impilahdentie 14 A, Laaksolahti, both of, Finland
Filed Mar. 5, 1969, Ser. No. 804,412
Claims priority, application Finland, Jan. 23, 1969, 206/69
Int. Cl. A63h 33/00
U.S. Cl. 46—1 R 5 Claims

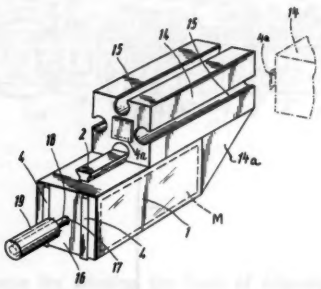
A toy comprises a number of mutually connected bodies of wood, plastic, metal, cork or the like arranged in a row in which consecutive bodies are joined turnably in such manner

that the friction between the surfaces of the bodies resting against each other counteracts the turning. In each body both



such contact surfaces have different directions, that is that in each body both turning axes have different directions.

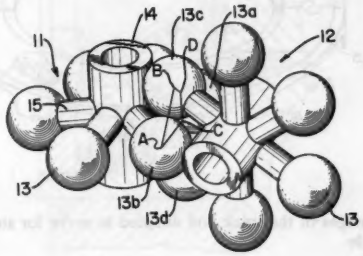
3,597,873
TOY CONSTRUCTION KIT
Artur Fischer, Altheimer Str. 219, Tumlingen, Germany
Filed July 28, 1969, Ser. No. 846,306
Claims priority, application Germany, Aug. 3, 1968, P 17 03 950.8
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 **10 Claims**



A toy construction kit includes, among other connectable structural elements, a plurality of building blocks of identical predetermined dimensions and outline. A drive unit comprises a housing whose outline and dimensions are identicals with those of the building blocks, and a prime mover which is accommodated in the housing and has an output shaft. Undercut male coupling heads and undercut female coupling grooves are provided on the housing and building blocks and the housing may thereby be connected to the building blocks in place of and in the same manner as another building block, so that the drive unit may be used as an integral component of the structure which is erected with the construction kit.

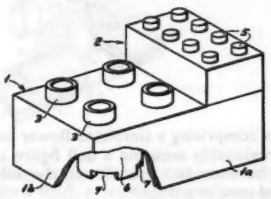
3,597,874
RELEASABLY INTERLOCKING UNITS HAVING A SNAP CONNECTION
Charles S. Ogsbury, Gold Hill, and Don C. Witte, Salina Star Route, Boulder, both of, Colo.
Filed Apr. 14, 1969, Ser. No. 815,614
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **16 Claims**

In a toy construction set, coordinated toy units are characterized by connectable members which radiate outwardly from common support and terminate in enlarged end portions of generally spherical shape and are so constructed and arranged that any pair of enlarged end portions will releasably interlock with a pair of enlarged end portions on another toy unit disposed at right angles thereto; or interlock with other toy members to make up a variety of geometric shapes. The enlarged end portions with modifications such as



opposed concave recesses permit the end portion of one unit to snap between a pair of end portions on another unit or an elongated shaping for the end portion provides suitable spacing for right angle connections. A single enlarged end portion and a hollow cylindrical hub, each preferably being slotted or hollow and of the same external dimension permits either to serve as a male or female coordinated locking joint portion for the toy units.

3,597,875
TOY BUILDING SET
Godtfred Kirk Christiansen, Billund, Denmark, assignor to Interlego A.G., Zug, Switzerland
Filed Nov. 18, 1968, Ser. No. 776,607
Claims priority, application Denmark, Nov. 29, 1967, 5973, Germany, Feb. 3, 1968, P 16 78 326.9
U.S. Cl. 46—25 **7 Claims**

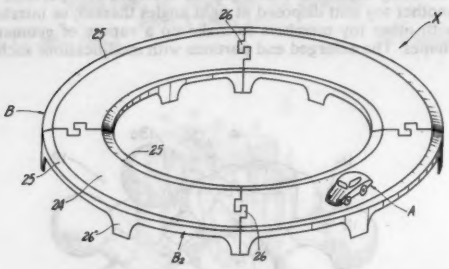


This application discloses toy building blocks of similar shape but constructed to different modules. They are buildable together and, to this end, the inner protrusions of the smaller blocks coact with the outer projections of the larger blocks differently from the coaction within the module which is disclosed in U.S. Pat. No. 3,005,282.

3,597,876
TOY ROADWAY SET
Sadao Haji, No. 3, No. 7, 3-chome, Kotobuki, Daito-ku, Tokyo, Japan
Filed Nov. 20, 1968, Ser. No. 777,249
Claims priority, application Japan, Nov. 22, 1967, Oct. 14, 1968, 42/98319 and 43/89568
Int. Cl. A63h *11/10*
U.S. Cl. 46—202 **9 Claims**

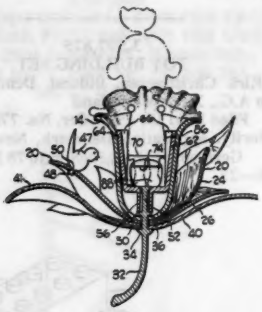
A motor-driven toy vehicle and a track adapted to guide it therealong in a zigzag manner in combination with guide means provided in the vehicle. The track is composed of a plurality of track sections, each of the track sections having a

level surface portion, a pair of inclined surface portions and joint means, the inclined portions being formed along the



side edges of the track and adapted to serve for steering the vehicle.

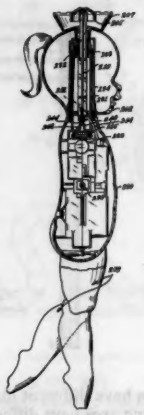
3,597,877
MULTIPURPOSE NOVELTY ITEM USED AS A DECORATION OR TOY
Samuel F. Speers, North Attleboro, Mass., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 23, 1969, Ser. No. 793,450
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 **3 Claims**



Apparatus comprising a simulated flower having anchoring means for removably securing a doll figure in position. The flower may be worn as a brooch and the doll figure may be removed and used as a toy.

3,597,878
ANIMATED TOY
Cedric E. Iwasaki, Hermosa Beach, and Raymond J. Douglas, Lomita, both of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed June 2, 1969, Ser. No. 829,617
Int. Cl. A63h *3/00*
U.S. Cl. 46—247 **13 Claims**

An animated doll, energizable by a reversible DC motor, selectively animating a stepping motion or a rotational motion with head spotting. The doll includes a rotatable shaft which is movable along its axis of rotation from a neutral position to an upward position in which the shaft engages a crankshaft assembly to cause the doll's legs to move with respect to the doll's torso to produce a stepping motion. The rotatable shaft is also movable to a downward position in which the shaft is inhibited from rotating, thereby causing the motor's housing, which is connected to the doll's torso, to rotate and to rotate the torso therewith. The doll's head is coupled to the torso with a torsion spring, which forms part of a head-spotting assembly. The latter is used to inhibit the rotation of the head during a fixed preselected portion of



each revolution of the doll's torso. All the doll's motions are controlled by a knob extending out of the doll's head.

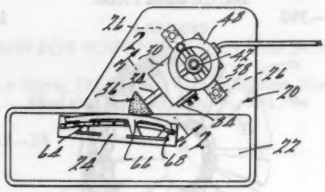
3,597,879
FLOWER-PETAL HOLDER
Joseph Sabeto Gallo, 58 Peach St., Walpole, Mass.
Filed Oct. 28, 1969, Ser. No. 871,881
Int. Cl. A01g *5/00*; **A41g** *1/00*
U.S. Cl. 47—55 **3 Claims**

The disclosure of the invention is a flower-petal holder which comprises a strip of a stiff material, such as a transparent plastic, which is folded across the middle forming opposed covers adapted to engage opposite sides of a petal, a wire stem which passes upwardly through an aperture in the fold of the material, and is hooked over the outer edge of one of said covers, and a fastener, for example, a staple, having the two legs thereof driven through the covers and enclosed petal at opposite sides of the wire stem and then bent over, so that the several elements of the flower and petal holder assembly are secured firmly together.

3,597,880
ICE-SKATING GRINDING APPARATUS
Leo I. Norgiel, 7621 W. Morrow Circle, Dearborn, Mich.
Filed Mar. 14, 1969, Ser. No. 807,180
Int. Cl. B24b *9/04*; **B21k** *17/00*
U.S. Cl. 51—102 **2 Claims**

A grinding apparatus for sharpening the edges of ice skates employing a conoidal abrasive element and aligning means

for grinding a symmetrical arcuate surface of a desired uniform concavity on the edge of an ice skate blade.

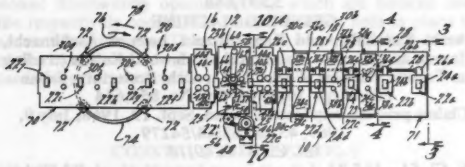


3,597,881

GRINDER FOR GRINDING THE FACES OF EDGE-SUPPORTED WORKPIECES

Dirck J. Olton, Loudonville, N.Y., and Witold C. Przygocki, Southfield, Mich., assignors to Murray-Way Corporation and Norton Company, Troy, N.Y., part interest to each

Filed Nov. 13, 1968, Ser. No. 775,468
Int. Cl. B24b *21/04, 47/00*
U.S. Cl. 51—135 31 Claims



An apparatus for grinding the faces of edge-supported workpieces such as metal slabs, billets, coil, strip and the like by means of a vertically disposed grinding head which can include an abrasive belt, with the apparatus including guide apparatus whereby the workpiece can be presented to the abrasive belt, and if desired, can be presented a plurality of times in reverse directions to the abrasive belt surface whereby several cuts can be made on the same surface, with the guide apparatus including a turntable whereby the workpiece can be turned 180° for grinding both sides.

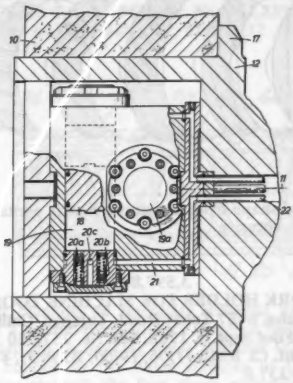
3,597,882

HYDRAULIC BALANCING OF ROTARY MEMBERS USING MOVABLE WEIGHTS

Anthony John Riddington, Peterborough, England, assignor to The Newall Engineering Company Limited, Old Fletton, Peterborough, Northamptonshire, England

Filed May 5, 1969, Ser. No. 821,795
Claims priority, application Great Britain, May 6, 1968, 21260/68
Int. Cl. B24b *45/00*
U.S. Cl. 51—169 9 Claims

The invention concerns a balancing assembly for rotary members such as grinding wheels. Two cylinders at right angles in the plane of rotation of the wheel each contain hydraulic fluid and a slidable balance weight. Signals from a vibration pickup are used to control fluid flow to and from the ends of the cylinders to alter the positions of the weights and correct unbalance of the wheel.

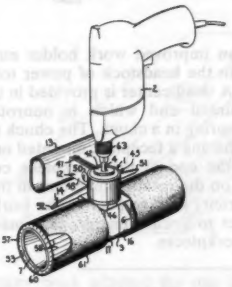


3,597,883

POWER-SANDING DEVICE

Robert L. Choplin, 304 N. Delaware, Independence, Mo., and Walter D. Hodge, 5237 Delmar, Roeland Park, Kans.

Filed Feb. 26, 1969, Ser. No. 802,361
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 PT 6 Claims



A power-sanding device has a housing rotatably supporting an elongate drive shaft extending therefrom and rotatably supporting driven shaft portions extending from opposed ends and having a sanding drum mounted on the extending ends thereof. Power means operatively engages the drive shaft to rotate the sanding drums through intermeshing gears on the drive and driven shafts. An elongate arm extends from the housing and has a gripping portion on one end thereof and a guard member mounted on the housing between the gripping portion and a portion of the sanding drums.

3,597,884

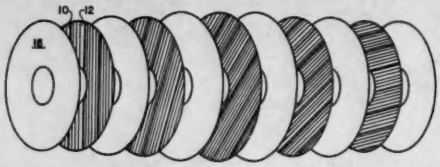
BORON RESIN CUTOFF AND ABRASIVE WHEEL

William T. Kaarlela, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Aug. 4, 1969, Ser. No. 847,047
Int. Cl. B24d *5/12, 11/00*
U.S. Cl. 51—207 6 Claims

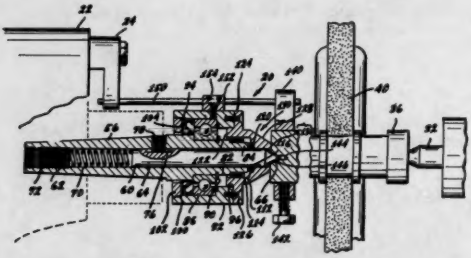
A combination of materials and method of using them in the forming of extremely long wear life and breakage resistant abrasive tools such as cutoff and grinding wheels. This invention utilizes superindurate materials such as boron, boron nitrides or boron carbides as the incorporated abrasive material. The several methods for incorporation of these

abrasive materials include lamination of filamentous tape containing the chosen abrasive and spinning or casting a tool



of the desired shape from a resinous matrix containing fibers of the chosen abrasive.

3,597,885
WORK HOLDER FOR MACHINE TOOLS
Ismael Gonzales, 6457 Tokay Road, Tujunga, Calif.
Filed Sept. 3, 1968, Ser. No. 757,060
Int. Cl. B24b *41/06, 19/00;* B23b *3/14*
U.S. Cl. 51—237 R **7 Claims**

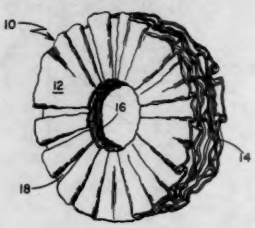


The invention is an improved work holder embodying a dead center for use in the headstock of power tools such as grinding equipment. A dead center is provided in the form of a rod having a pointed end which is nonrotatable but retractable against a spring in a chuck. The chuck is provided with a rotating body having a faceplate mounted on a bearing in such a way that the end of the workpiece comes flush against the faceplate on the rotating member. In this manner, precision of concentricity with respect to the workpiece and precision with respect to linear dimensions is maintained in working on similar workpieces.

3,597,886
METHOD OF VIBROABRASION TREATMENT OF SMALL-SIZED PARTS
Vladimir Vasilievich Sapozhnikov, Petropavloskaya ulitsa, 8, kv. 10; Vladimir Nikolaevich Smirnov, ulitsa Smirnova, 13, kv. 27; Alexandr Mikhailovich Soloviev, Prospekt Smirnova, 13, kv. 60, and Roman Izrailevich Shneider, ulitsa Plekhanova, 16, kv. 12, all of Leningrad, U.S.S.R.
Filed Mar. 12, 1969, Ser. No. 806,725
Int. Cl. B24b *1/00*
U.S. Cl. 51—316 **5 Claims**

According to the method proposed herein, in an inert liquid medium are introduced abrasive powder and metallic bodies or particles which are capable of fixing the particles of abrasive powder on their surface and grinding these while interacting with said abrasive powder in the course of treatment of the small-sized parts involved, said abrasive powder that is introduced into said inert liquid medium, should feature its granularity permissible to perform the initial stage of treatment of the small-sized parts involved e.g. coarse grinding, whereas the quantitative ratio between the metallic bodies and abrasive powder that are introduced into said liquid medium, must be so selected as to provide a successive and complete grinding of abrasive powder till obtaining its granularity necessary to perform the final stage of treatment of said small-sized parts e.g. buffing.

3,597,887
RESILIENT ABRASION
Elisha Winthrop Hall, Jr., Scituate, Mass., assignee to F. L. & J. C. Godman Company, Rockland, Mass.
Continuation-in-part of application Ser. No. 676,902, Oct. 20, 1967, now abandoned. This application July 1, 1970, Ser. No. 51,444
Int. Cl. B24d *11/00*
U.S. Cl. 51—395 **10 Claims**

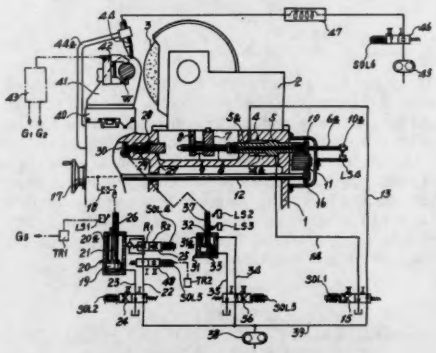


A buffing member comprising a multiplicity of thin, flexible elements secured for rotation about an axis and adapted to wipe across a workpiece wherein each element comprises a substrate in the form of a sheet member of a fibrous mesh, synthetic resinous elastomeric substance comprising elastomeric foam permanently bonded in and to the mesh, and a distribution of abrasive substance permanently bonded to the foam.

ERRATUM

For Class 51—165 see:
Patent No. 3,597,933

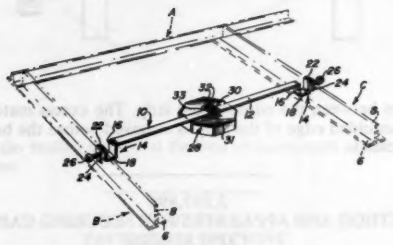
3,597,888
GRINDING MACHINE
Takeshi Kusakabe, and Kenji Suzuki, both of Asahimachi, Japan, assignors to Toyoda Koki Kabushiki Kaisha (trading as Toyoda Machine Works, Ltd.), Aichi Prefecture, Japan
Filed Sept. 10, 1969, Ser. No. 856,614
Claims priority, application Japan, Sept. 19, 1968, July 9, 1969, 43/68163;44/54279
Int. Cl. B24b *49/14*
U.S. Cl. 51—165.73 **13 Claims**



A grinding machine comprising a grinding wheel support for rotatably supporting a grinding wheel, a table for supporting a workpiece, means for rapidly moving the grinding wheel support toward and away from the workpiece, and means for moving the grinding wheel support toward the workpiece at a feed speed for rough-grinding operation which is lower than the speed of the means for moving the grinding wheel support toward and away from the workpiece, wherein the grinding wheel support is separated from the workpiece after the rough-grinding operation in order to cool

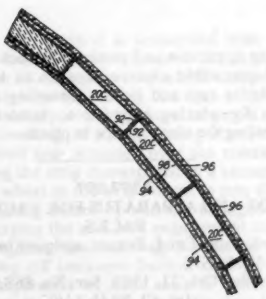
the workpiece, following which the wheel support is advanced to the workpiece for the fine-grinding operation so that the workpiece, which is thermally expanded during the rough-grinding operation, recovers from the expanded condition prior to the fine-grinding operation, whereby a more accurate size of the finished workpiece will be attained.

3,597,889
JUNCTION BOX SUSPENSION UNIT FOR SUSPENDED CEILINGS
Antonio Lo Nigro, 192 Brooks St., East Boston, Mass.
Filed Oct. 8, 1969, Ser. No. 864,794
Int. Cl. E04g *17/18*
U.S. Cl. 52—28 **1 Claim**



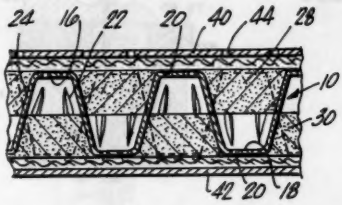
A suspension unit for installation in an openwork or grid-type suspension ceiling and which can be relied upon to support a fixture-hanging junction box. It comprises a one-piece strap-iron supporting bar which is adapted to bridge the space between a pair of the usual inverted T-irons. The respective outer end portions feature right angularly positioned downwardly opening hooks which are hooked over the respectively cooperable T-irons and are held in place by accessible setscrews. The straight flat-faced median portion of the bar serves to adjustably mount a hanger clip which is carried by the junction box.

3,597,890
CONSTRUCTION ASSEMBLY
Alfred A. Hala, 28 Meeks Lane, Islip, N.Y.
Continuation-in-part of application Ser. No. 647,463, June 20, 1967, now abandoned. This application Sept. 15, 1969, Ser. No. 868,956
Int. Cl. E04b *1/32, 2/14;* **E04c** *2/16*
U.S. Cl. 52—86 **9 Claims**



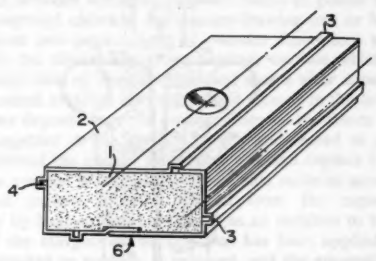
A construction assembly comprising a plurality of individual construction units connected together. Each of the construction units comprises a pervious resin-impregnated fibrous mesh material. The walls of the construction units have a cementitious material secured to the exterior surface thereof by permeating the pervious resin-impregnated fibrous mesh material and forming an integral structure therewith.

3,597,891
INTERIOR ABSORPTIVE PANEL
Flyodd A. Martin, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation
Filed Oct. 2, 1969, Ser. No. 863,239
Int. Cl. E04b *1/82;* **E04c** *2/32*
U.S. Cl. 52—145 **3 Claims**



Perforated blankets of fiberglass material are fitted on each side of a double-dimpled core material having perforations therethrough. A backing sheet and face sheet of panel material is bonded to the outer surfaces of the dimples. Sound passing through the face sheet material enters the panel and is dissipated in the fiberglass material in the core. The panel has no resonant frequency and has a high coefficient of absorption over a broad band of frequencies in the speech frequency range.

3,597,892
REFRACTORY BRICK
Grant M. Farrington, Jr., Marlton, N.J., assignor to General Refractories Company, Philadelphia, Pa.
Filed Jan. 8, 1969, Ser. No. 789,896
Int. Cl. E04b *2/30;* **F27d** *1/06*
U.S. Cl. 52—599 **4 Claims**

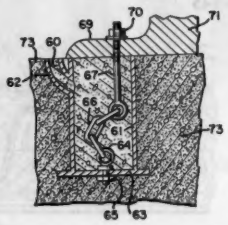


A refractory brick adapted for use in furnace roof construction and having bonding faces and nonbonding faces and a casing sheet of oxidizable metal carried on at least one of the bonding faces, the casing including a sheet characterized by at least one spacing rib projecting from at least one surface, the rib or ribs being disposed longitudinally along the longest dimension of the bonding faces of the brick and along a line or lines to one side of the centerline and at least one-half the distance from the centerline to one edge of the bonding faces. Preferably, the spacing ribs are disposed in surface engagement with the brick side face and function to space the one surface of the sheet therefrom. The relative size, configuration and positioning of the spacing ribs of the sheet permits substantially complete oxidation of the steel during use without resulting in growth in overall sheet thickness, and maintains uniform bearing stress conditions in furnace roof brick joints.

3,597,893
CONCRETE INSERT APPARATUS
Abram N. Spanel, 344 Stockton St., Princeton, N.J.
Filed Jan. 21, 1969, Ser. No. 792,731
Int. Cl. E04b *1/38;* **E04c** *5/12*
U.S. Cl. 52—707 **5 Claims**

A concrete insert device utilizes a longitudinal tubular member disposed about a given axis. A bolt member of a

length less than the height of the tubular member is secured within the tubular member by coupling means. The coupling means permit positioning of the bolt in said tubular member along any axis intersecting an open face area bounded by the top periphery of the tubular member, which axes are parallel



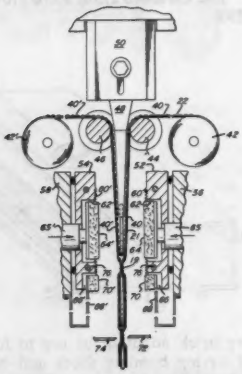
to the given axis. The coupling means further assures that the threaded portion of the bolt as desirably positioned, also extends about the height of the tubular member; to which threaded portion a machine member to be mounted on a concrete floor is thus secured.

3,597,894

METHOD FOR PACKAGING FLAT OBJECTS

Brian G. Harrison, Drexel Hill, Pa., assignor to The Franklin Mint, Inc., Yeadon, Pa.

Filed July 22, 1969, Ser. No. 843,526
Int. Cl. B65b *9/02*; **B65d** *85/54*
U.S. Cl. 53—28 **5 Claims**



Coins or other generally flat objects are packaged by being sandwiched between plastic layers at least one of which has an embossed surface juxtaposed to the coin or object to prevent tracing the surface contour thereof through said one layer. The plastic layer is of stiff plastic material such as polystyrene so that it cannot be opened by heat or will rupture or crack if tampered with. Indicia on a paper layer joined to the plastic layer is printed with ink which is soluble in aromatic hydrocarbon solvents such as toluol.

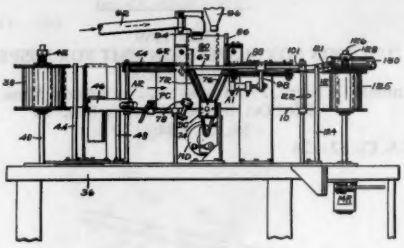
3,597,895

PACKAGING METHOD AND MACHINE

Harold A. Jensen, Brockton, Mass., assignor to The Linvure Company, Inc., Boston, Mass.

Filed Sept. 8, 1969, Ser. No. 856,092
Int. Cl. B65b *43/12, 43/30, 43/36*
U.S. Cl. 53—29 **7 Claims**

The packaging method involves forming a continuous strip of connected bags by folding a sheet longitudinally, and forming a series of transverse seams extending only partially across the strip from the fold toward the unfolded edge of the strip. The strip is fed lengthwise to position a bag at a loading station; then a portion of the strip is retracted to open that bag for loading, aided by a collapsible tube and a blower. A reversal of the retraction recloses each bag after loading, and it is then sealed by a longitudinal seam joining the transverse



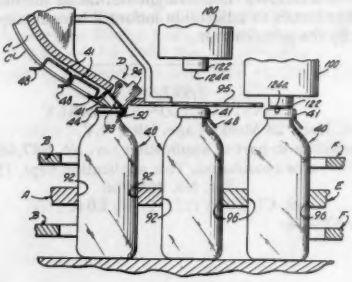
seams between the edges of the strip. The excess material at the unfolded edge of the strip is removed before the bags are separated.

3,597,896

METHOD AND APPARATUS FOR SECURING CAPS TO CONTAINERS

Stanley J. Koll, Keansburg, N.J., and John M. Rocus, Elk Grove Village, Ill., assignors to American Flange & Manufacturing Co., Inc., New York, N.Y.

Division of Ser. No. 473,987, July 22, 1965, Pat. No. 3,460,311.
Filed Feb. 18, 1969, Ser. No. 800,202
Int. Cl. B65b *7/28*
U.S. Cl. 53—42 **17 Claims**



A crimping apparatus and method for securing lightweight metal hand-removable closure caps on to bottles. The apparatus includes cap and bottle conveying and positioning mechanisms for placing caps on to bottles and crimping heads for sealing the closure caps in place.

3,597,897

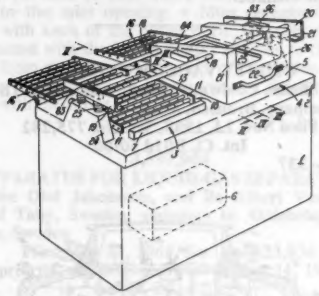
METHOD OF AND APPARATUS FOR VACUUM SEALING PACKS

Alain Gerard, Saint-Coud, France, assignor to W. R. Grace & Co., New York, N.Y.

Filed Oct. 21, 1969, Ser. No. 868,065
Int. Cl. B65b *31/02*
U.S. Cl. 53—84 **9 Claims**

This invention relates to a method of and apparatus for vacuum sealing packs. Primarily, there is provided a cover movable in a first direction from a position adjacent a first sealing station to a position adjacent a second sealing station, and then in a second direction substantially perpendicular to the first direction to form a closed vacuum sealing chamber at the second station whereat a vacuum sealing operation is

conducted. Preferably an electromagnetic arrangement is provided so that the cover can be precisely positioned adjacent the sealing station at the end of movement in the first direction.



3,597,898

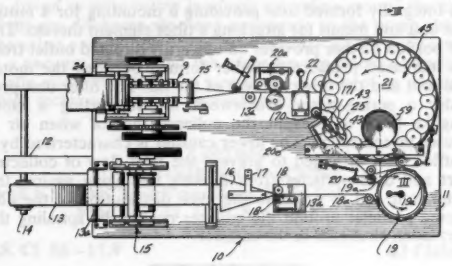
PACKAGING MACHINE

Charles E. Cloud, Wilmette, Ill., assignor to Cloud Machine Corporation, Skokie, Ill.

Continuation-in-part of application Ser. No. 504,709, Oct. 24, 1965, now abandoned. This application May 7, 1969, Ser. No. 852,518

Int. Cl. B65b *9/08*

U.S. Cl. 53—183 **33 Claims**



The machine and method is concerned with several different features including an apparatus for cutting uniform size articles from a continuous strip which comprises a rotating indexing wheel for supporting the strip at the transverse seals, a ganged rotary rotating slicer having a plurality of blades for intermeshing at a strip slicing zone, means comprising a holddown arm mounted over the rotating indexing wheel for holding the strip thereagainst in a centered position on the indexing wheel as the strip advances into the strip slicing zone, and biasing means operatively engaged against the holddown arm urging the arm into engagement with the strip and the strip against the indexing wheel. In addition, a method of cutting off packages from a strip having spaced filled pouches separated by heat seals is disclosed, which method comprises the steps of feeding the strip into a series of traveling annularly arranged elements, moving a series of traveling annularly arranged knives sequentially into cooperative package severing association with the series of traveling elements, capturing a free leading end portion of the strip restraining the captured portion while and after the trailing edge of the package is severed at the trailing heat seal and then controllably releasing the severed package to deposit the package onto an adjacent surface.

3,597,899

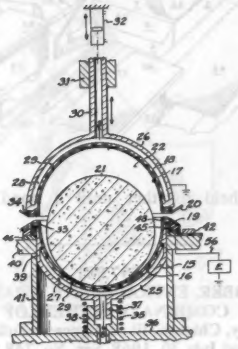
METHOD AND APPARATUS FOR ENCAPSULATING FLUID AND OTHER MATERIAL IN SEALED CONTAINERS

Donald LeRoy Hanson, Sylmar, Los Angeles, Calif., assignor to American Foods Machinery Corporation

Filed Nov. 21, 1966, Ser. No. 595,742

Int. Cl. B65b *3/02*

U.S. Cl. 53—184 **3 Claims**



This invention provides a means and method whereby materials, either liquid, plastic or solid, (e.g. foods) are encapsulated between vertically opposed sheets of plastic film such as polyvinyl chloride, by vacuum-drawing one or both of the sheets into pocket form of oversize dimensions with relation to the dimensions of a container capsule which is subsequently formed from the opposed sheets after depositing the content material into the pocket formed in the lower sheet. After deposition of the content material the sheets are brought together at the pocket margin and sealed to one another around the margin to develop a sealed capsule containing the content material. The plastic film material around the sealed margin is then severed from the capsule, preferably by heat-cutting performed as an incident to heat sealing of the margin, the suction that has been applied to form the pocket or pockets, is released, and the encapsulating film is permitted to shrink by plastic memory, into clinging contact with the enclosed contents of the capsule. In many applications, air is evacuated from the capsule during the encapsulating process, and for some foods a preservative gas is substituted.

3,597,900

MACHINE FOR BONDING TOGETHER A PAIR OF THERMOPLASTIC COATED PANELS

Dale K. Scott, Jonesboro, Ga., assignor to The Mead Corporation

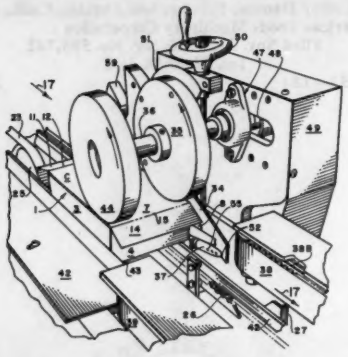
Filed July 28, 1969, Ser. No. 845,382

Int. Cl. B65b *7/20, 51/20*

U.S. Cl. 53—375 **3 Claims**

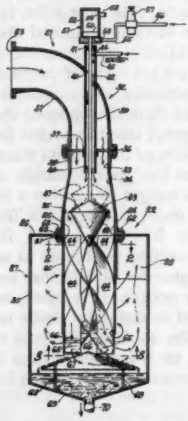
For binding in face-contacting relation a pair of box panels coated with thermoplastic material, the machine and method of this invention utilize transport means for moving the box and panels along a predetermined path, positioning and holding means for moving one of the panels into a position of spaced relationship to the other of said panels and for holding the panels in spaced relation for a brief period of time, nozzle means interposed between the panels for directing a blast of hot air in the direction of the panels and at an angle so as to scavenge atmospheric air whereby the thermoplastic coating on the panels is quickly heated. Thereafter the panels

are quickly and firmly forced into face-contacting relation while still under the influence of the stream of hot air, the



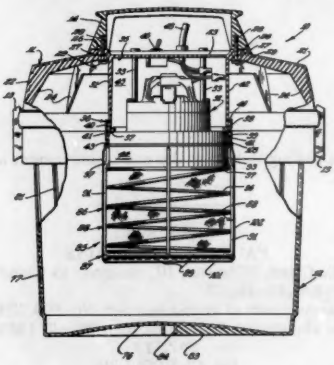
panels being held together until a bond is established therebetween.

3,597,901
GAS SCRUBBER, ENTRAINMENT SEPARATOR AND COMBINATION THEREOF
John M. Heeney, Chicago, Ill., assignor to Fuller Company
Filed July 30, 1968, Ser. No. 748,846
Int. Cl. B01d *47/00*
U.S. Cl. 55—241 **7 Claims**



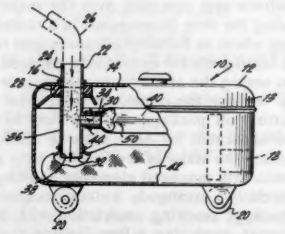
A gas scrubber for removing particles carried in suspension by gas is used with or without a specific entrainment separator. The scrubber has (1) a gas-conducting conduit with a portion having an inner surface that diverges in the direction of gas flow, (2) a diverter that is disposed in this portion of the conduit and that has an opposed diverging surface with a greater degree of divergence, and (3) a pipe that feeds scrubbing liquid to that surface of the diverter for flowing liquid into the downward flow of gas. Preferably, the diverter is supported from above and is resiliently urged upwardly so that the diverter is automatically moved by a change in the rate of gas flow. The scrubber provides an annular flow of gas that is changed to a helical downward flow by the specific entrainment separator, disposed below the diverter and having helically extending elongated plates in a vertical conduit within a chamber. A frustoconical diverter is disposed below the bottom open end of that vertical conduit to change the direction of the gas leaving the vertical conduit. The elongated plates are radially disposed within the vertical conduit and extend in a helical manner about the longitudinal axis of that conduit. Another conduit communicates tangentially with a sidewall opening of the chamber adjacent its top to exhaust the gas from the annulus between the chamber and the vertical conduit. Accumulated liquid is removed from the bottom of the chamber.

3,597,902
UTILITY VACCUM CLEANER
Clyde H. Williams, Coldwater, Mich., assignor to The Scott & Fetzer Company, Bronson, Mich.
Filed Nov. 13, 1968, Ser. No. 775,282
Int. Cl. B01d *50/00*
U.S. Cl. 55—337 **3 Claims**



A utility vacuum cleaner having a two-piece housing including an upper portion forming a lid for a lower-canister portion in which dirt is directly collected. The lid portion is an integrally formed unit providing a mounting for a motor fan unit and means for attaching a filter element thereto. The lid portion further provides an upwardly directed outlet from an increased pressure chamber formed between the motor fan unit and the inner surface of the lid. The filter unit provides a spring-biased framework for supporting a cloth baglike filter to prevent the collapse thereof when air is drawn therethrough. The lower canister is characterized by a baffled inlet arranged to prevent the inlet flow of collected dirt and dust particles from directly impinging against the filter unit and to promote the even distribution of the collected particles around the canister portion by spiraling the dirt laden airstream in the canister.

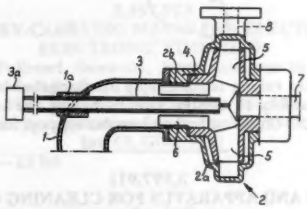
3,597,903
MEANS FOR MAINTAINING THE SUCTION CAPACITY OF A VACUUM CLEANER
Robert Schaaf, Brooklyn, N.Y., assignor to Mil-An Mfg. Corp.
Filed Sept. 27, 1968, Ser. No. 763,315
Int. Cl. B01d *46/02*
U.S. Cl. 55—341 **5 Claims**



Means for maintaining the suction capacity of a vacuum cleaner by providing inlet means into the internal compart-

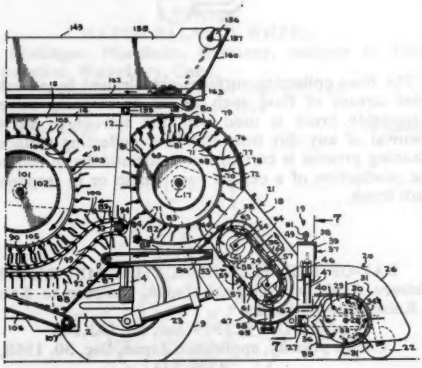
ment of the vacuum cleaner comprising a manifold conduit disposed through an inlet opening into said compartment and having at least two outlet ports in clearance position with respect to the inlet opening, the outlet ports being disposed in spaced relation to each other and also in-line and offset relation to the inlet opening, a filter receptacle being associated with each of the outlet ports, whereby the receptacle associated with the in-line port is adapted to first separate the dirt from an incoming stream of dirt-laden suction-induced air to be followed, if required, by the receptacle associated with the offset port.

3,597,904
APPARATUS FOR LIQUID-GAS SEPARATION
Karl Folke Olof Jakobsson, and Bo Albert Voss-Schrader, both of Taby, Sweden, assignors to Aktiebelaget Celleco, Tumba, Sweden
Filed May 12, 1969, Ser. No. 823,836
Claims priority, application Sweden, May 14, 1968, 6461/68
Int. Cl. B01d *52/24*
U.S. Cl. 55—408 **2 Claims**



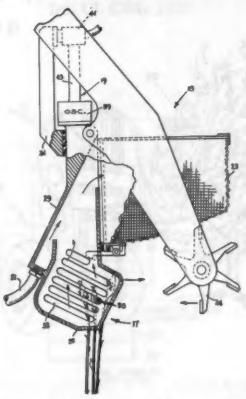
A liquid with entrained gas is fed through a supply pipeline connected coaxially to the suction side of a centrifugal pump, and a gas-discharge pipe has one end portion extending coaxially into the supply pipeline, there being wings arranged to be driven so as to rotate in a path extending around the axis of the gas-discharge pipe and concentric to the pump shaft. The other end portion of the gas-discharge pipe is connected to a vacuum source, and the wings have portions extending axially along this discharge pipe in the vicinity of its opening which receives the gas to be discharged.

3,597,905
POD-STRIPPING MACHINE
Virgil N. Jarrell, West Evans Road, Viola, Del.
Filed Apr. 21, 1969, Ser. No. 817,811
Int. Cl. A01d *45/22, 45/24*
U.S. Cl. 56—11.9 **23 Claims**



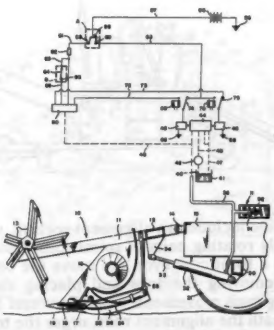
A self-propelled machine for stripping pods from vines, which has means for lifting cut vines from the field and feeding them sequentially to a plurality of drums having spring fingers to engage vines and carry them through spaced fingers of a stationary, or movable, concave about part of the drum, to shred the vines and strip the pods from them. Pods are collected on conveyors below the drum stations and carried to a storage bin. The bin has means to unload the pods to a transporting vehicle, or place of storage.

3,597,906
THRESHING DEVICE
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed Feb. 14, 1969, Ser. No. 799,424
Int. Cl. A01d *41/08*
U.S. Cl. 56—13.3 **11 Claims**



A device for utilization in the threshing of crop elements such as grain which effectively removes the seed from the chaff in the field, comprising means for engaging individual grains or heads, subjecting such grains to resonant sonic vibration whereby they are easily separated from the stock and chaff, and means for drawing the separated grains into a hopper or similar storage portion of the machine.

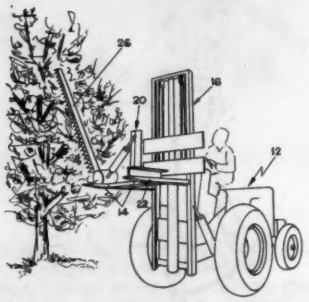
3,597,907
HEADER ELEVATIONAL CONTROL SYSTEM FOR CROP-HARVESTING MACHINE
Archie E. Neal, Garfield, Wash., assignor to J. E. Love Company, Garfield, Wash.
Filed Feb. 15, 1965, Ser. No. 432,600
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **5 Claims**



An elevational control system for the header of a crop-harvesting machine wherein the header is pivotally connected to the machine and a hydraulic cylinder is used to vertically position the header. A floating cutting platform is connected to the header and has a ground-engaging portion which acts to yieldably transfer a portion of the weight of the header to the ground. A pressure-responsive switch in the hydraulic

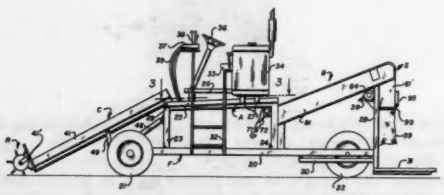
system controls the supply of fluid to the cylinder so that a change in the system pressure caused by the header riding too high or too low results in vertical adjustment of the header so as to restore the predetermined load distribution between the hydraulic system and the ground.

3,597,908
TREE-PRUNING APPARATUS
William A. Schaefer, Sparta; Donald W. Zufelt, Casanovia, and Donald Grossman, Grant, all of, Mich., assignors to Spar Jet Pruner, Inc., Grant, Mich.
Filed Dec. 27, 1968, Ser. No. 787,522
Int. Cl. A01d *55/00*
U.S. Cl. 56—233 **5 Claims**



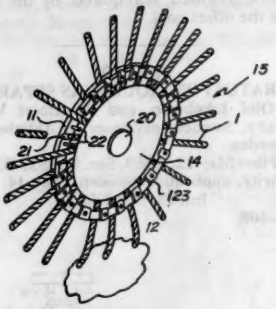
This disclosure relates to a tree-trimming cutter for trimming the branches of orchard trees, for example. the cutter has a longitudinal blade with reciprocating cutting teeth and is mounted on a forklift tractor which raises and lowers the cutter. An arm supports the blade for movement between upright and downwardly extending positions. The arm is laterally adjustable relative to the base so as to move the cutter out form the tractor as desired for cutting.

3,597,909
MACHINE FOR HARVESTING ONIONS AND THE LIKE
Fred E. Lauridsen, Sr., and Fred E. Lauridsen, Jr., both of 1001 D Street, Greeley, Colo.
Filed Dec. 2, 1968, Ser. No. 780,445
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 R **3 Claims**



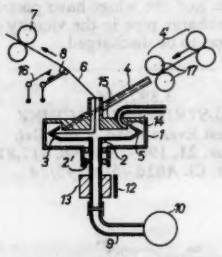
The machine includes an alignment section, such as including oppositely rotating pairs of spiral rolls, which receive the onions from a front conveyor and move the onions toward a cutter for removing the tops and placing the onions, top down, during such movement. a paddle wheel having flexible blades, beneath the alignment rolls, urges the tops toward the cutter, while a flexible skirt is engaged by the blades to wipe the onion tops off the blades. A conveyor, which receives the topped onions from the cutter, is used as a picking table, for culling purposes, while the onions are delivered through hollow, upright chutes into sacks, with reversible plates in the chutes for directing the onions to alternate sacks, and handle-operated bars for moving a sack off hooks, at the lower edge of the chute opposite the operator.

3,597,910
RESILIENT RAKE TOOTH
David N. Stewart, Box 111, Erskine, Alberta, Canada
Filed Sept. 3, 1969, Ser. No. 855,159
Claims priority, application Canada, Mar. 14, 1969, 045-768
Int. Cl. A01d *77/00*
U.S. Cl. Ryan **3 Claims**



A resilient raking tooth having an elongated body formed from a plurality of twisted strands having the ends thereof secured from unrolling and an annular support for said tooth.

3,597,911
METHOD AND APPARATUS FOR CLEANING OPEN-END SPINNING DEVICES
Adolf Schiltknecht, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Aug. 17, 1967, Ser. No. 661,332
Claims priority, application Austria, Aug. 24, 1966, A 8043/66
Int. Cl. D01h *11/00, 7/00*
U.S. Cl. 57—56 **19 Claims**

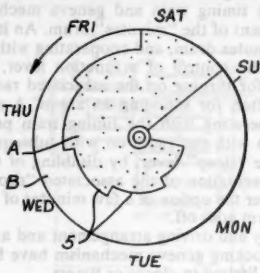


The fiber collecting surfaces are cleaned by an intensive brief stream of fluid such as air or cleaning solvent. A retractable brush is used with the solvent to aid in the removal of any dirt from the fiber collecting surface. The cleaning process is carried out automatically in response to the production of a certain yarn length or in response to a yarn break.

3,597,912
DAY-OF-THE-WEEK INDICATING MECHANISM
Tatsuro Akahano, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha
Filed Dec. 8, 1969, Ser. No. 883,048
Claims priority, application Japan, Dec. 30, 1968, 43/96,533
Int. Cl. G04b *19/24*
U.S. Cl. 58—5 **5 Claims**

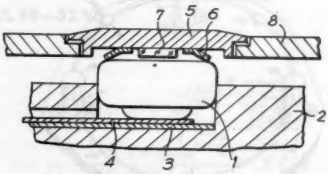
A Days-of-The-Week Indicating Mechanism for a timepiece wherein a day disc is provided, divided into two portions by a boundary line extending along a substantially spiral path along said day disk, each of said day disk portions

being of a different color and being transparent or semitransparent. A radially extending window opening is provided in a



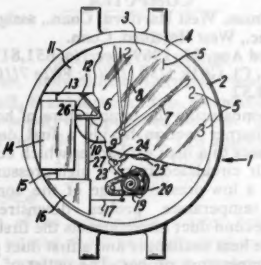
calendar window of the dial plate, said boundary line being positioned so that the days of the week are indicated by the position of said boundary line in said window.

3,597,913
BATTERY-CARRYING MEANS FOR ELECTRIC OR ELECTRONIC TIMEPIECE
Motoyuki Fujimori, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Dec. 29, 1969, Ser. No. 888,772
Claims priority, application Japan, Jan. 10, 1969, 44/2358
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 BA **3 Claims**



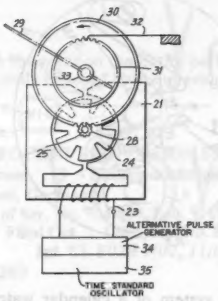
A battery-carrying means for an electric or electronic timepiece wherein the elastic contact means projecting from the cover providing access to a battery-receiving means in said timepiece are positioned on the cover so as to be out of contact with the projected portion of the battery should said battery be inserted with said projected portion facing said cover. An insulating member or a space is provided between said cover and said projected portion to prevent contact therebetween should said battery be so inserted.

3,597,914
WATCH BALANCE WHEEL
Heinz Meitinger, Pforzheim, Germany, assignor to Timex Corporation, Waterbury, Conn.
Filed Sept. 11, 1969, Ser. No. 857,165
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 R **8 Claims**



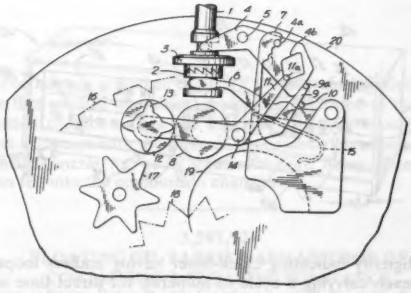
An electric-powered watch includes a balance wheel assembly which drives time display means. The balance wheel assembly includes a pivoted balance wheel staff, a central member fixed to the staff, and a balance wheel rim consisting only of a bundle of wires which are adhered together and self-supporting. The wires form a coil which cooperates with one or more magnetic fields to impulse the balance wheel assembly.

3,597,915
DRIVING DEVICE OF ELECTRONIC WATCH
Susumu Aizawa, 10616 Takagi, Shimosuua-machi Suwa-gun, and Yoshifumi Gomi, 6248-1, Nishichino, Miyagawa, Chino-shi, both of Nagano, Japan
Filed Nov. 3, 1969, Ser. No. 873,224
Claims priority, application Japan, Nov. 5, 1968, 43/80514
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 D **2 Claims**



A driving device for an electronic timepiece including a multipole stepping motor driven by an alternative pulse generator operating under the control of a time standard oscillator. The timepiece includes a time indicating gear train including an indexing mechanism having a pawl and a ratchet wheel attached to the second wheel of said train to insure the incremental step action of said stepping motor.

3,597,916
DAY AND DATE CORRECTOR MECHANISM FOR A WATCH
Yasuichi Nakagawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed June 13, 1969, Ser. No. 833,053
Claims priority, application Japan, June 20, 1968, 51836
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **3 Claims**



A day and date corrector mechanism mounted for pivotable displacement from outside said watch and having a quadrilateral aperture therein. A corrector wheel lever cooperatively engages said quadrilateral aperture for the selective positioning of a day and date corrector wheel mounted on said corrector wheel lever. The setting lever is pivotably displaceable between three positions, at one of

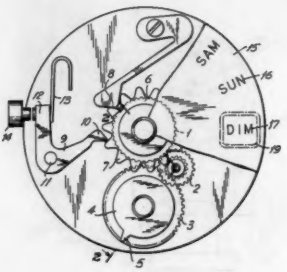
which said corrector wheel lever may rock between one operative engagement of said corrector wheel for day correction and another operative connection of said corrector wheel for date correction. At the other of the two positions of said setting lever, said corrector wheel lever is restrained with the corrector wheel in a neutral position, while winding and hand setting functions are respectively performed.

3,597,917

DAY-INDICATING SYSTEM OF A CALENDAR WATCH

Hideho Odagiri, Nagano-ken, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 26, 1969, Ser. No. 810,582
Claims priority, application Japan, Mar. 29, 1968, 43/20219
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 6 Claims



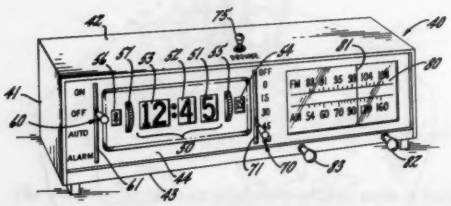
A day-indicating system of a calendar watch including a day dial having the days of the week indicated thereon in at least two forms, the day star wheel secured to said day dial for rotation therewith being adapted for advancement through a plurality of increments during each day, one of said increments being associated with each of said day indications. Means is provided for advancing said day star wheel, each day, a number of increments equal to the number of forms of day indications disposed on said day dial. Adjustment means is provided for manually advancing said day star wheel an increment at a time to select the desired form of day indication.

3,597,918

DIGITALLY INDICATING CLOCK-TIMER

Ralph C. Robinson, Mooresville, N.C., assignor to General Time Corporation, Stamford, Conn.

Filed Oct. 6, 1969, Ser. No. 863,886
Int. Cl. G04b *19/02*
U.S. Cl. 58—125 14 Claims



A digitally indicating clock-timer having endless loops of tape, each carrying a cycle of numerals for direct time indication, with the tapes being driven by drums of small diameter which are coupled together by geneva-type mechanisms so constructed that each tape is advanced one unit only upon completion of passage of a complete cycle of numerals on the tape of next lower order. In the preferred embodiment, such "cycle stepping" is achieved by employing two geneva stages in series with one another. The tape is disposed in a folded, reentrant arrangement for maximum compactness with the driving drums in alignment in central position. A transparent guide member enables illumination of the tape by transmitted light. A synchronous motor serves to drive the minute tape via a timing train and geneva mechanism for stepped advancement of the "minutes" drum. An hour wheel coupled to the minutes drum, and cooperating with an alarm set wheel under the control of a function lever, serves to operate a switch for turning on the associated radio and, a short time thereafter, for sounding an alarm. A settable "sleep" lever cooperating with the timing train permits the user to fall asleep with the radio on with subsequent automatic turnoff. The "sleep" lever, by disabling of the alarm, also serves upon actuation of the associated "drowse" button, to give the user the option of a few minutes of additional sleep after the alarm goes off.

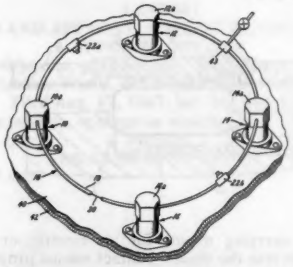
The tape display and driving arrangement and a particular form of positive locking geneva mechanism have features of general utility not limited to clocks or timers.

3,597,919

LINEAR GAS GENERATOR ACTUATED LATCHING AND THRUSTING DEVICE

James L. Lilly, Wayne, Pa., assignor to General Electric Company

Filed Mar. 24, 1969, Ser. No. 809,724
Int. Cl. F01b *29/08, 31/00, 9/00*
U.S. Cl. 60—26.1 10 Claims



Apparatus for providing fluid actuation of a plurality of devices by the use of a combustible cord continuously extending through fluid actuation chambers for each of the devices. One or more ignition means are provided for the combustible cord. After the cord is ignited, combustion of the cord propagates down its length. When combustion of the cord within a fluid actuation chamber occurs, the gases formed thereby effect actuation of the device.

3,597,920

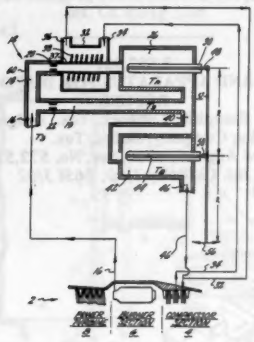
TURBINE INLET TEMPERATURE SENSOR AND COMPUTER

Harold A. Wadman, West Hartford, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Aug. 21, 1969, Ser. No. 851,817
Int. Cl. G01k *5/50, 13/02;* F02c *7/10*
U.S. Cl. 60—39.52 10 Claims

A device for measuring the temperature of hot gases from a gas turbine burner section having a first duct which introduces the gases to a heat exchanger which cools the gases by means of air circulated from a high-pressure stage of a compressor to a low-pressure stage of the compressor and two spaced temperature probes downstream of the exchanger. A second duct interconnects the first duct portion upstream of the heat exchanger and a first duct portion intermediate the temperature probes. The outlet of the first duct portion, downstream of the second temperature probe, also communicates with the compressor section so as to establish

a pressure differential between the inlet and outlet of the device. A mechanical linkage is pivotably secured to the outputs of the two temperature probes and yields a reading that is proportional to the temperature of the hot gases.

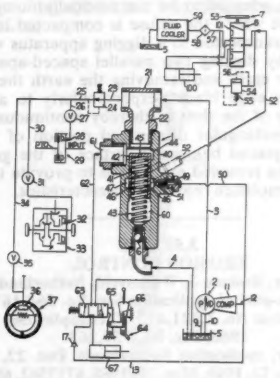


3,597,921

PRIORITY FLOW CONTROL VALVE

James R. McBurnett, Stillwater, Okla., assignor to Allis-chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 19, 1969, Ser. No. 877,934
Int. Cl. F15b *11/16*
U.S. Cl. 60—52 VS 10 Claims



A flow control valve in a hydraulic system having a single source of pressurized fluid. The flow control valve provides priority of flow for predetermined actuators and pressure control for a plurality of hydraulic actuators.

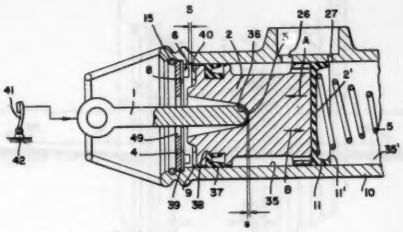
3,597,922

MASTER CYLINDER

Gert Schrader, Schweinfurt, Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 731,055, May 22, 1968, now Patent No. 3,509,722. This application Mar. 12, 1970, Ser. No. 18,819
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.6 7 Claims

The piston of an automotive master brake cylinder is progressively rotated about its longitudinal axis The intermittent rotation, occurring during each stroke, is designed to eliminate premature furrowing of the primary sealing cup of the piston at that part of its circumference which repeatedly passes over an unsmooth portion of the cylinder wall, e.g. a wall having one or more openings for the intake of brake fluid. Through the rotation the entire periphery of the primary cup is uniformly exposed to the unevenness in the wall.

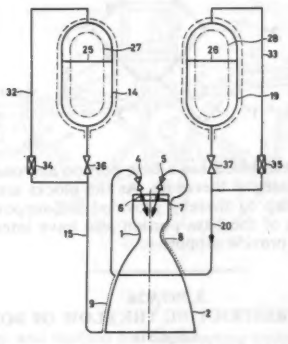


3,597,923

ROCKET PROPULSION SYSTEM

Michael Simon, 3 Emkemdorfstrasse, 2 Hamburg-Othmarschen, Germany

Division of Ser. No. 704,480, Feb. 9, 1965, abandoned.
Filed Oct. 2, 1969. Ser. No. 871,028
Int. Cl. F02k *9/02, 11/02*
U.S. Cl. 60—260 1 Claim



For starting a rocket engine, a plurality of liquified gases are first gasified at ambient temperature and fed to the combustion chamber. Then the liquefied gases are brought into heat exchange with the walls of the combustion chamber and exhaust nozzle for being gasified before being mixed and then fed into the combustion chamber.

3,597,924

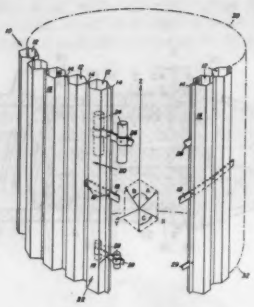
FLOATING OIL BARRIER AND METHOD OF CONTAINING A FLOATING SUBSTANCE

Murray Risin, Palm Beach Gardens, and Robert M. Snyder, Jupiter, both of, Fla., assignors to Ocean Science and Engineering, Inc., Washington, D.C.

Filed Feb. 7, 1969, Ser. No. 797,523
Int. Cl. L02b *15/04*
U.S. Cl. 61—1 14 Claims

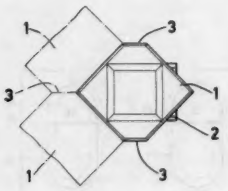
A system for circumscribing and impounding oils floating on the surface of water which includes a water-impervious,

floating enclosing barrier presenting a substantially rigid vertical surface to the oil with means permitting limited move-



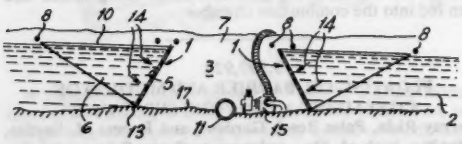
ment of the barrier in the horizontal and vertical planes to compensate for constantly changing wave shapes and forms.

3,597,925
RETAINING WALL BLOCK
Sugiaki Kusatake, No. 132, Hachiken-cho, Nishikitsuji, Nara City, Nara Prefecture, Japan
Filed Sept. 30, 1968, Ser. No. 763,573
Int. Cl. E02b *3/12*
U.S. Cl. 61—4 **4 Claims**



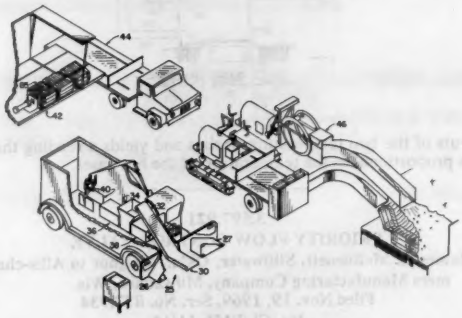
A retaining wall block has a base portion and one or more bracing struts integral therewith. As the blocks are stacked, the struts overlap to thereby provided self-support for the wall. The sides of the base portion also have interengaging portions which provide support.

3,597,926
METHOD OF RESTRICTING THE FLOW OF BODIES OF LIQUID
Peter Riddett, Southampton, England, assignor to Hovercraft Development Limited, London, England
Continuation-in-part of application Ser. No. 680,167, Nov. 2, 1967, now abandoned. This application Jan. 20, 1970, Ser. No. 4,349
Int. Cl. E02b *3/10, 7/00*
U.S. Cl. 61—30 **12 Claims**



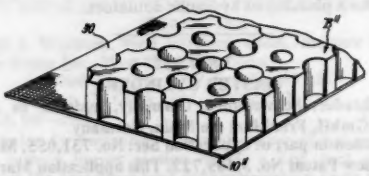
To form a water dam a succession of wall members of flexible sheet material of generally U-section, are spread across and immersed in the water, and contiguously arranged and constrained against deflection by pressure of the water they are to retain, so that the pressure distends the members into sealing engagement with each other. The wall members may be arranged in either horizontally or vertically extending rows. In addition to being used completely to dam water basins or courses, the wall members may be arranged to form cofferdams and lock gates, or to restrict the flow of any body of liquid.

3,597,927
METHOD AND APPARATUS FOR DISPOSING OF REFUSE
Charles Wayne Hemphill, Lubbock, Tex., assignor to Concentric Engineering Company, Dallas, Tex.
Filed Aug. 15, 1966, Ser. No. 572,520
Int. Cl. B60p *1/00;* **B65f** *3/02*
U.S. Cl. 61—35 **2 Claims**



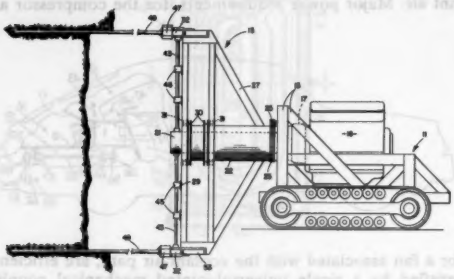
Method and apparatus for collecting and disposing of refuse by collecting refuse from a multiplicity of garbage cans which are adapted to be automatically dumped into a compacting unit where the refuse is compacted into a bale. The bales are transported to a digging apparatus which provides a ditch by digging two parallel spaced-apart vertical slots within the earth and removing the earth therefrom by passing a knife edge blade perpendicularly to and at the lower extremity of the slots to thereby continuously remove an elongated rectangular disengaged portion of the earth. The bales are placed below the surface of the ground and covered with the removed earth so as to provide the ground with improved moisture retention characteristics.

3,597,928
EROSION CONTROL
Jan Carel Pilaar, Boslaan 3, Warnsveld, Netherlands
Continuation-in-part of application Ser. No. 564,167, July 11, 1966, now Patent No. 3,421,417. This application Sept. 12, 1968, Ser. No. 759,263
Claims priority, application Netherlands, Dec. 22, 1967, Jan. 3, 1968, Jan. 23, 1969, Mar. 20, 1968, 6717542, 6800032, 6800961, 6803917
Int. Cl. E02b *3/14*
U.S. Cl. 61—38 **26 Claims**



The invention relates to an erosion-controlling protective surfacing for the soil comprising flexible liquid-permeable supporting sheet means conforming to the contour of the soil and a mat of blocks on said supporting sheet means, said mat having drainage passageways therethrough so that water can pass through the surfacing. Preferably, the surfacing includes filter means and the blocks are secured to the supporting sheet means.

3,597,929
METHOD AND DEVICE FOR TUNNELING
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed Aug. 2, 1968, Ser. No. 749,686
Int. Cl. E01g 5/06
U.S. Cl. 61—42 2 Claims



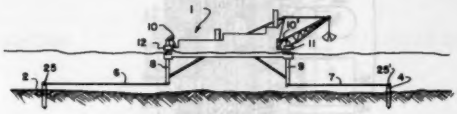
A method and device for tunneling comprising driving a plurality of interlocking staves into the earth about a chosen circumference, by resonantly sonically vibrating the staves as they are being driven. After a circumference of the staves are formed the core of earth therebetween is removed to form the tunnel.

3,597,930
METHOD AND APPARATUS FOR REINFORCING IN SITU IN PILE CASING
William R. Rochelle, Houston, Tex., and Ronald Lee Wycoff, Rolla, Mo., assignors to Brown & Root, Inc., Houston, Tex.
Filed Apr. 4, 1969, Ser. No. 813,479
Int. Cl. E02b 17/00; E02d 5/64
U.S. Cl. 61—46 9 Claims

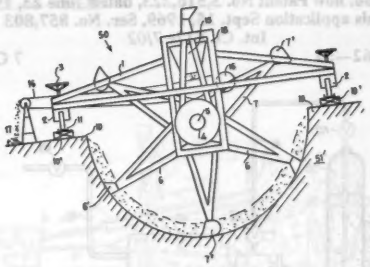
A method of reinforcing, in situ, a piling comprising the steps of: gaining access into the pile casing, cleaning mud and debris from the interior of the casing and simultaneously removing the debris, inserting stiffening or reinforcing material into the casing and sealing the pile casing access opening. The step of simultaneously cleaning and removing is essentially performed by a pile cleanout device comprising a fluid jetting portion operable to dislodge and fragment sediment and other debris within the jacket pile casing, and a gas lift portion integral therewith to remove the fragmented matter from the interior of the pile casing.

3,597,931
ANCHORAGE SYSTEM AND METHOD OF USE
Carl G. Hard, 14 Spring Lane, Framingham, Mass.
Filed Oct. 9, 1969, Ser. No. 865,103
Int. Cl. B63b 21/00
U.S. Cl. 61—46.5 7 Claims

The invention relates to marine anchorage systems and their use. The anchorage system is a mooring spud having a detachable shoe that is fastened to a mooring cable leading from the spud shoe to a winch, having an adjustable drag, on board the vessel. By means of drawing in and paying out the mooring cable the vessel may be moved in an accurately traced path so as to cover a marine floor in a manner consistent with precision dredging operations. A modification includes a shoe provided with a vibrator to effect deeper penetration of the shoe into the marine floor.



3,597,932
MEANS AND METHOD FOR CONSTRUCTION OF HYDRAULIC CHANNELS
Manuel B. y Sebastian, Virgen Maria 7, Madrid, Spain
Division of Ser. No. 661,627, Aug. 8, 1967, Pat. No. 3,491,466, which is a continuation-in-part of application Ser. No. 584,649, Oct. 6, 1966, now abandoned. Filed July 28, 1969, Ser. No. 845,344
Int. Cl. E02b 5/02
U.S. Cl. 61—63 4 Claims



A means and method for constructing hydraulic channels of semicircular or circular cross section is provided where two parallel lines define side edges of the channel. Guide means are mounted on the parallel lines forming a track for a set of wheels and a mobile carriage having wheels is positioned on the guide means. The carriage carries a shaft tube positioned parallel to the two parallel lines and lying in a position corresponding to the axis of the channel to be formed. The shaft tube mounts means for digging of the channel by motion in planes perpendicular to the axis whereby earth or other dug materials can be dropped to the side of the parallel lines.

3,597,933
REMOTE GRINDING HEAD
Cyril J. Astill, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Sept. 17, 1968, Ser. No. 760,213
Int. Cl. B24b 49/00
U.S. Cl. 51—165.87 5 Claims

There is provided a apparatus for the automatic compensation for deterioration or reduction in diameter of a cutting tool, such as a grinding wheel, whereby machining may be

resumed, without further adjustment after such compensation. The invention is particularly suitable for remote operation under hazardous conditions such as might be experienced in highly radioactive environments.

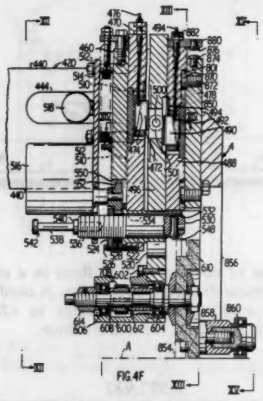


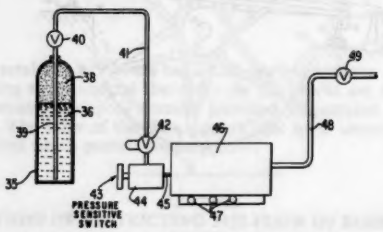
FIG. 4F

3,597,934

METHOD AND APPARATUS FOR SUPPLYING MEASURED QUANTITIES OF A VOLATILE FLUID

Harold Willids Andersen, Oyster Bay; Harold W. Andersen, Laurel Hollow, and Charles H. Harrison, Oyster Bay, all of, N.Y., assignors to H. W. Andersen Products, Inc., Oyster Bay, N.Y.

Continuation-in-part of application Ser. No. 561,777, June 30, 1966, now Patent No. 3,516,223, dated June 23, 1970.
This application Sept. 15, 1969, Ser. No. 857,803
Int. Cl. F17c *7/02*
U.S. Cl. 62—52 **7 Claims**



The method and apparatus for controlling the delivery from a source of supply to a point of utilization of accurately measured quantities of volatile fluids, supplied as liquids and delivered as gases wherein a liquid under pressure is fed to a chamber where it remains a liquid under lower pressure and thence to an expansion chamber where the liquid is completely evaporated and maintained as a gas under relatively uniform constant pressure, and from which chamber the gas is delivered in measured quantities as required; heat being supplied to said expansion chamber to ensure evaporation of the liquid and to replace the heat lost through delivery of the gas.

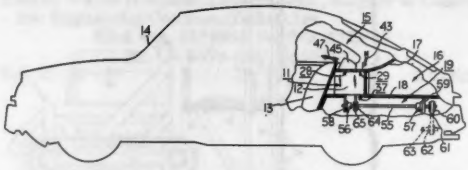
3,597,935

AUTOMOTIVE AIR CONDITIONING

Michel A. Pierrat, Andover, Mass., assignor to Automatic Radio Mfg. Co., Inc, Melrose, Mass.

Filed Apr. 20, 1970, Ser. No. 29,871
Int. Cl. B60h *3/04*
U.S. Cl. 62—243 **12 Claims**

A self-contained factory-assembled and sealed air-conditioning unit is arranged for inconspicuous floor-mounted installation at the rear of the passenger compartment of a compact car, forwardly of the firewall ahead of a rear engine. The usual separate conditioned-air circulation path is provided at the top of the relatively small unit, in sealed relation to lower coolant-air paths running between laterally spaced bottom openings which communicate with corresponding floorboard openings for intake and discharge of ambient coolant air. Major power requirements, for the compressor and for a fan associated with the coolant-air path, are efficiently satisfied by a single universal-jointed mechanical coupling with an auxiliary power shaft extending forwardly from a pulley-driven relationship with the rear engine. Auxiliary ducting, body openings, separate sources of power for the compressor and fan, separate installations of system components, and disturbance of sealed refrigerant lines, are all advantageously avoided.

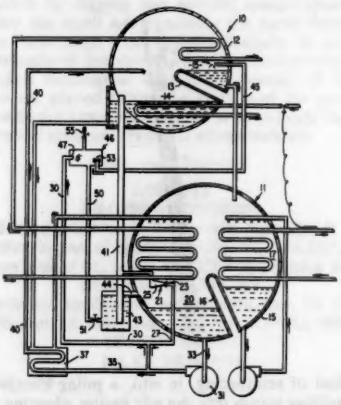


3,597,936

PURGE SYSTEM FOR LITHIUM BROMIDE ABSORPTION WATER CHILLER

Eddie L. Dyre, and John A. Greacen, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,812
Int. Cl. F25b *15/06*
U.S. Cl. 62—474 **4 Claims**



Solution is pumped from the low-pressure side of the system for operating a jet eductor which functions to entrain noncondensable gases in the low-pressure side in the solution passing through the eductor. The solution and entrained gases are discharged from the eductor into a passage means operable to separate the gases from the solution and discharge the gases into the high-pressure side. Purge means is connected to the high-pressure side for venting the gases to the atmosphere.

3,597,937

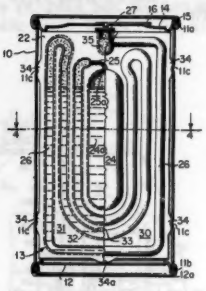
SELF-COOLING DEVICE FOR BEVERAGE CONTAINER

Eugene H. Parks, 6841 Almaden Road, San Jose, Calif.

Filed June 6, 1969, Ser. No. 831,156
Int. Cl. F25d *3/10*
U.S. Cl. 62—294 **10 Claims**

A device for cooling the contents of a container compris-

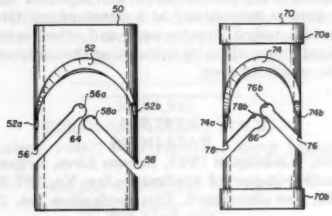
ing a compressed gas chamber and a heat exchanger in heat-conducting relationship with the contents whereby in permitting the gas to expand into the heat exchanger, heat is absorbed for cooling the contents.



3,597,938
FLEXURE JOINT

James S. Hellen, Wayne, N.J., and John C. Stiles, Thousand Oaks, Calif., assignors to Singer-General Precision, Inc., Little Falls, N.J.

Filed May 21, 1969, Ser. No. 826,556
Int. Cl. F16d *3/52*
U.S. Cl. 64—15 **3 Claims**



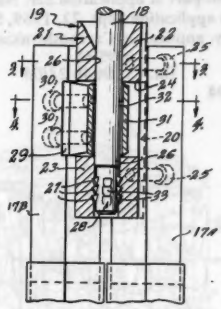
A flexure joint and a method of manufacturing same, in which one or more pairs of slots are formed through the wall of a unitary tubular member, the ends of one slot of each pair terminating a predetermined circumferential distance from the corresponding ends of the other slot of the same pair to form at least two flexure portions.

3,597,939
CONTROL ASSEMBLY FOR A NUCLEAR REACTOR INCLUDING AN OFFSET COUPLING

Charles C. Ripley, and Frederick L. Suckow, both of San Jose, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 25, 1969, Ser. No. 836,360
Int. Cl. F16c *3/00*
U.S. Cl. 64—1 R **6 Claims**

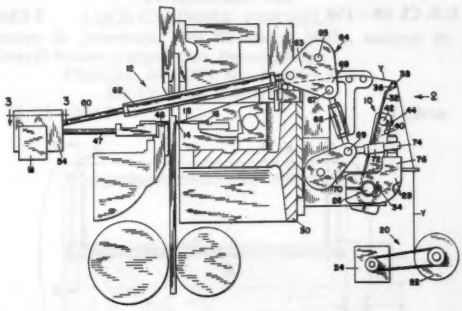
A control assembly for a nuclear reactor including two control rods operated by a single drive shaft. The control rods and drive shaft are linked by coupling members extending radially from the control rods, one of the coupling members including two spaced arms and the other coupling member including a single arm adapted to fit between the two spaced arms, the drive shaft extending through holes in the coupling members to serve as the hinge pin of the hinge formed by the coupling members, the lower end of the drive shaft and the lowermost arm of the coupling member mating in a Christmas tree coupling. The upper and lower surfaces of the central coupling member are curved convexly to allow for vertical angular deflection between the coupling members without binding.



3,597,940
YARN TENSION CONTROL MEANS FOR WARP-KNITTING MACHINE

Robert H. Dupuis, Leicester, Mass., assignor to Crompton and Knowles Corporation

Filed June 23, 1969, Ser. No. 835,628
Int. Cl. D04b *27/14*
U.S. Cl. 66—86 R **7 Claims**



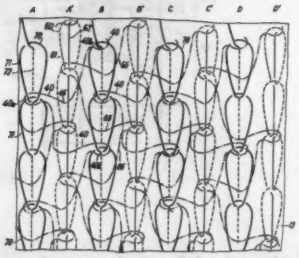
A compensator for the knitting of yarn in warp knitting machines in which one or more springs are anchored at one of their ends to a movable support and in turn support a tension roll at their other ends. The tension roll is yieldable against the bias of the springs in response to increase in tension of yarn trained around the roll. Actuating means are operated in timed relation with the knitting needles to move the support in a manner which moves the tension roll in a direction for releasing yarn to the knitting needles during peak yarn consumption and in a direction for taking up slack yarn during periods of little or no consumption, the relative positions of the springs and tension roll remaining the same with respect to the support so that the stress on the springs remains the same for a given yarn tension.

3,597,941

BASE FABRIC WITH BILATERAL PILES

Frantisek Jindra, Domazlice; Richard Boruta, As, and Bohumil Barton, Kdyne, all of, Czechoslovakia, assignors to Elitex-Lavody Textilniko Strojirenstoi, Liberec, Czechoslovakia

Continuation-in-part of application Ser. No. 858,935, Sept. 18, 1969. This application Sept. 22, 1969, Ser. No. 861,547
Claims priority, application Czechoslovakia, Sept. 20, 1968, 6595/68
Int. Cl. D04b 23/08
U.S. Cl. 66—194 10 Claims



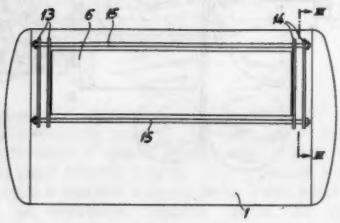
Bilateral pile fabrics in which a base fabric, such as a fibrous fleece sheet, has on both sides staggered courses and aligned wales, and including pile threads on both sides extending in successive courses between adjacent wales.

3,597,942

DEVICE FOR DYEING OR WASHING CARPETS

Erich Grimme, and Leonhard Knierriem, both of Erbach, Odenwald, Germany, assignors to Bruckner-Apparatebau Michelstadt GmbH, Erbach, Odenwald, Germany

Filed July 10, 1969, Ser. No. 840,781
Claims priority, application Germany, July 18, 1968, July 18, 1968, P 17 60 909.5;P 17 75 236.2
Int. Cl. D06f 17/00
U.S. Cl. 68—196 5 Claims



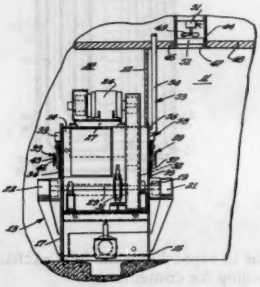
An elongated cylindrical pressure vessel has a longitudinally extending door in the cylindrical wall of the vessel, through which a carpet can be introduced or removed. A bolt for securing the door is divided into at least three axially aligned portions each of which is wholly receivable in a socket in which it is also axially movable, at least one of such sockets being secured to the door, and at least one of such sockets being secured to the vessel. The bolt portions are movable in unison between a position in which each bolt portion is wholly received in its socket and a position in which at least two bolt portions are engaged both in a socket secured to the door and in a socket secured to the vessel.

3,597,943

STERILIZED LAUNDRY SYSTEM

Wallace F. Gayring, Minoa, N.Y., assignor to G. A. Braun, Inc., Syracuse, N.Y.

Filed June 17, 1969, Ser. No. 834,083
Int. Cl. D06f 39/14
U.S. Cl. 68—210 11 Claims



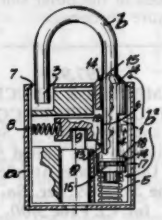
A sterilized laundry system utilizes a washing machine sealingly mounted in a common wall of a soiled area and a sterilized area and includes first and second door means respectively providing access from the soiled and the sterilized areas into an interior of a washing drum horizontally disposed within the washing machine, releasable locking means normally maintaining the pair of doors in a locked position and control means selectively releasing the locking means only to permit opening the doors in a manner to prevent cross infection between the separate rooms. The sterilized area is maintained at a constant positive pressure relative to the soiled laundry area and other areas ambient the sterilized room, thereby preventing flow of contaminated air into the sterilized area.

3,597,944

PADLOCKS

Noel Litvin, Washington 1945, Buenos Aires, Argentina

Continuation-in-part of application Ser. No. 759,865, Sept. 16, 1968, now abandoned. This application Jan. 27, 1970, Ser. No. 6,059
Int. Cl. E05b 67/22, 67/06
U.S. Cl. 70—38 C 7 Claims

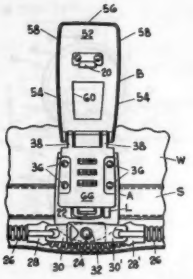


A padlock includes a housing having a U-shaped locking bolt with a pair of legs extending into the housing. One of the legs is of increased diameter and a recess is defined in the increased diameter portion of the leg which is arranged to receive a movable latching member. The recess and the latching member interlock to prevent inadvertent unlocking of the padlock, except by operation of the operating mechanism of the lock.

3,597,945
LATCHING DEVICE AND COMBINATION LOCKING MEANS

Irving Feinberg, Saddle Brook, N.J., assignor to Presto Lock Co., Inc., Garfield, N.J.

Filed July 11, 1969, Ser. No. 840,993
Int. Cl. A45c *13/10*; E05b *37/02, 65/52*
U.S. Cl. 70—74 19 Claims

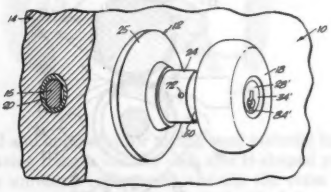


A latching device of the type which includes a latch pivotally connected to a body member employs a resiliently mounted, manually operable plug connected to the body member for longitudinal sliding movement with respect thereto. Cooperable means are provided by the latch and the plug to releasably connect the latch to the plug. The latch overlies the body member in the latched condition of the device and, in such condition, the exposed side of the device provides a flat, continuous surface. Combination locking means of the type to permit the selection of a combination of one's own secret choice is associated with the plug to releasably lock the plug in its latched position. The means for selecting or changing the combination is covered by the latch in the latched condition of the device. In the unlatched position of the latch, the means for changing the combination is exposed at the front of the device and on the same side that one views the dials of the combination locking means.

3,597,946
BURGLAR FOILING LOCK

Irene Mikkelson, 16001 N.E. 9th Ave., North Miami Beach, Fla.

Filed Jan. 8, 1970, Ser. No. 1,364
Int. Cl. E05b *35/10*
U.S. Cl. 70—224 6 Claims

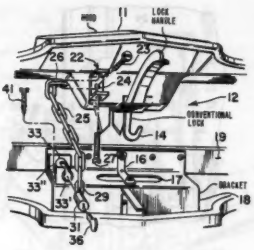


Lock improvement means particularly for use in the operating mechanism of a building door lock of the type having an outside doorknob enclosing a cylinder lock assembly and wherein the lock assembly may be removed by removing the doorknob which typically is removed through use of a room key or master key and when the door lock is in an unlocked disposition. The invention provides cylinder keylock means releasably operative in clockwise movement by use of either a room key or master key and also is operative in counterclockwise movement through use of a grand master key; the lock assembly of the invention is operative normally by use of the room key or master key when turned respectively in a clockwise direction, and is counterclockwise turnable only through use of a grand master key for removing the doorknob and keylock cylinder structure.

3,597,947
AUTOMOBILE HOOD-LOCKING DEVICE

Joseph Solow, Box 116, Plainview, N.Y.

Filed June 30, 1969, Ser. No. 837,659
Int. Cl. E05b *65/19*; E05c *17/36*
U.S. Cl. 70—240 3 Claims

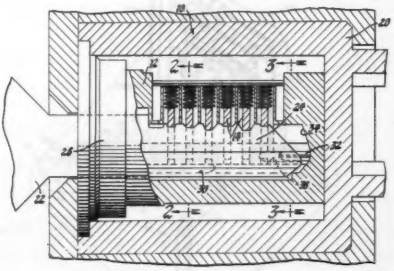


An automobile hood-or trunk-locking device formed of disengaging parts and so fashioned that the parts can be readily secured between the underside of a hood and frame parts of the automobile thereunder for any different type of vehicle which includes a chain with a lock barrel attached to the hood and frame parts by the simple drilling of undersize holes therein, and securing the attaching parts thereto by means of thread-cutting screws. One of the attaching parts being of cylindrical shape adapted to slidably receive a lock barrel and a chain link and secured to the cylinder by a key-operating latch, making necessary the use of the owner's key to disengage the lock barrel and the chain from the attached parts to allow the hood to be raised its full extent.

3,597,948
LOCK CYLINDER ASSEMBLY

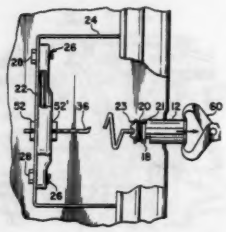
Theodore H. Johnstone, New Baltimore, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1969, Ser. No. 791,112
Int. Cl. E05b *15/08, 19/06*
U.S. Cl. 70—364 R 1 Claim



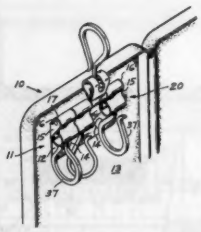
A core of a conventional tumbler-type lock cylinder assembly includes an additional rib which receives only an additional groove in the free end of the bitted portion of the key to increase the number of usable lock combinations.

3,597,949
ANTITHEFT LOCK DEVICE
Gus T. Nigrelli, 8871 19th Ave., Brooklyn, N.Y.
Filed Apr. 28, 1970, Ser. No. 32,555
Int. Cl. E05b 15/16, 63/00
U.S. Cl. 70—422 10 Claims



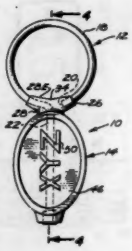
A vehicle trunk-locking system having a latching mechanism and including a frangible tail extension member coupled to a lock cylinder, the tail extension being adapted to engage the latching mechanism to operate a locking latch. Unauthorized removal of a lock cylinder from the vehicle will fracture the tail extension member leaving a portion thereof within the latching mechanism to thereby prevent insertion of an instrument into the latching mechanism for operating the locking latch.

3,597,950
KEY-HOLDING ATTACHMENT FOR KEY CASES
Charles W. Elsenheimer, Meriden, Conn., assignor to Prentice Corporation, Kensington, Conn.
Filed Jan. 15, 1969, Ser. No. 791,355
Int. Cl. A44b 15/00
U.S. Cl. 70—456 B 4 Claims



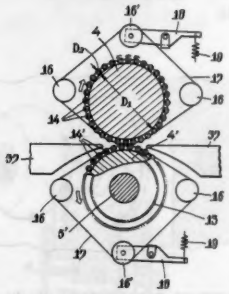
The keyholders to which the key hooks are attached each consist of a single piece of metal bent to form a pivotal body provided with a slot starting at the free end of the body and extending up the back thereof so that no portion thereof is observable at the front of the holder. The metal piece is also bent to form an inner spring finger, the free end of which coacts with the upper rear portion of the slot to control the insertion and removal of the key hook.

3,597,951
KEYHOLDER
Jack Nadel, Los Angeles, Calif., assignor to Republic Corporation, Beverly Hills, Calif.
Filed Sept. 18, 1969, Ser. No. 859,083
Int. Cl. A44b 15/00
U.S. Cl. 70—459 4 Claims



A keyholder comprising a ring with a gap, a frame for receiving the ring to bridge the gap, and a spring for holding the ring against the frame. The ring is formed by a length of stiff wire, one end being bent into the ring shape and the other end being straight. The frame has a hole for receiving the straight wire portion, and a groove for receiving the ring to resist rotation of the ring so it has to be pulled out and rotated 90° to allow access to the gap.

3,597,952
PLANETARY ROLLER LEVELER FOR SHEET METALS
Choichiro Soda, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan
Filed July 22, 1969, Ser. No. 843,305
Claims priority, application Japan, July 24, 1968, 43/52290
Int. Cl. B21d 1/02
U.S. Cl. 72—163 2 Claims



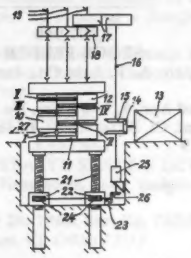
Two backup rolls having work rollers arranged on the peripheral surface thereof and adapted to roll thereon are arranged adjacently one above the other. The ends of said work rollers on each said backup roll are supported by a pair of holding disks, and a certain relative speed of rotation is given to said pair of holding disks and the backup roll so that the work rollers simultaneously rotate about their own axis and about the axis of the backup roll. The machine operates as a leveler which levels metal sheet passing between the rotating work rollers.

3,597,953

ROLLING-MILL STAND FOR REVERSING ROLLING

Karl Josef Neumann, Ingbert-Saar, Germany, assignor to Moeller & Neumann G.m.b.H., Ingbert-Saar, Germany

Filed Aug. 7, 1968, Ser. No. 750,955
Int. Cl. B21b *39/14*
U.S. Cl. 72—223 2 Claims



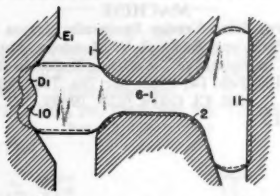
A rolling mill stand having at least three rolls for reversing rolling of rods or bars whose rolls are disposed vertically. From pass to pass either the rolling mill stand or the oppositely disposed tilting or lifting tables are vertically adjusted.

3,597,954

METHOD AND APPARATUS FOR ROLLING STEEL MATERIAL AND RAILS OR SIMILARLY SHAPED PRODUCTS

Koe Nakajima; Hisashi Naoi; Kanichi Kishikawa; Hidehiko Abe, and Kazunari Tanaka, all of Kitakyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 13, 1969, Ser. No. 790,766
Claims priority, application Japan, Jan. 16, 1968, 43/2,213
Int. Cl. B21b *13/10*
U.S. Cl. 72—225 4 Claims



A method and apparatus for rolling steel material into steel products having flanges such as rails and H-shaped products by use of a universal rolling mill wherein the cross section along the direction of axis of the vertical roll of the universal rolling mill has a convex shape. Therefore, the rolling by such vertical roll gives a reduction of nearly V-shaped concentration to the part of the steel material contacting said vertical roll and to be made into a flange.

3,597,955

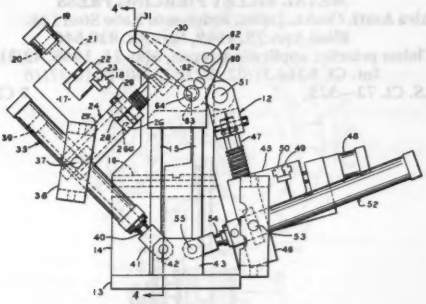
APPARATUS FOR STRETCH DRAWING SHEET STOCK UNDER CONTROLLED TENSION

Robert A. MacKenzie, Chagrin Falls, Ohio, assignor to The Cyril Bath Company, Cleveland, Ohio

Filed Jan. 13, 1969, Ser. No. 790,519
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 7 Claims

An apparatus for stretch drawing sheet metal between complementary male and female dies arranged between two stretch heads which grip opposite margins of the sheet and tension it unidimensionally into its yield range independently of die closure.

While maintaining the sheet so tensioned with its lateral margins unconfined, the heads wrap the sheet about the male die prior to closure of the dies. Beginning at the end of the wrapping operation and continuing during final closure of the dies, the gripping pressure exerted by the heads on the gripped margins of the sheet is reduced sufficiently to eliminate the independent tensioning by the heads while holding the sheet steady. The reduction is such as to permit



the margins to slip between the gripping jaws of the head under the tensioning force imposed by closure of the dies at some portions along the width of the sheet whereat die configuration requires that additional stock exteriorly of the dies at the ends thereof be drawn or fed in between the dies, while other portions where additional stock is not required are held firmly in place but free from the independent tensioning by the heads.

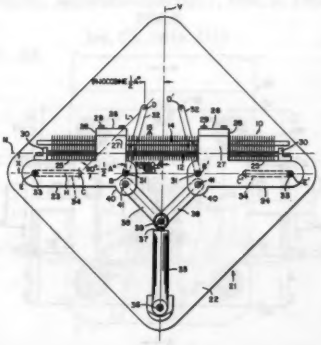
The final drawing by the dies occurs before the sheet can work harden as a result of having been independently tensioned into the yield range.

3,597,956

APPARATUS FOR CONSTRUCTING A FIN-AND-TUBE HEAT EXCHANGER HAVING A BEND FORMED THEREIN

Dale R. Clausing, LaCrescent, Minn., assignor to The Trane Company, LaCrosse, Wis.

Division of Ser. No. 641,940, May 29, 1967, Pat. No. 3,468,009.
Filed Mar. 7, 1969, Ser. No. 825,473
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 7 Claims



A method and apparatus for constructing a fin-and-tube heat exchanger having a bend formed therein by bending the

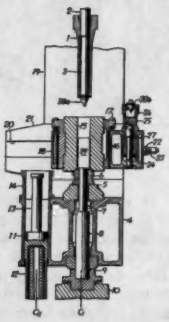
heat exchanger with apparatus which does not support or contact the heat exchanger fins at the situs of the bend, and a method for constructing a multirow fin-and-tube heat exchanger having a bend formed therein to facilitate the bending operation by initially expanding the tubes of only one row to fix the spacial relation of the fins during the bending step and allowing the tubes of the other rows to move freely relative to the fins during the bending operation, to thereby eliminate adverse distortion of the fins especially in the bend area.

3,597,957

METAL BILLET PIERCING PRESS

Akira Asari, Osaka, Japan, assignor to Kobe Steel Ltd.

Filed Apr. 29, 1969, Ser. No. 820,046
Claims priority, application Japan, May 11, 1968, 43/31487
Int. Cl. B21d *31/02*; B21c *23/00*; B21d *37/16*
U.S. Cl. 72—325 7 Claims



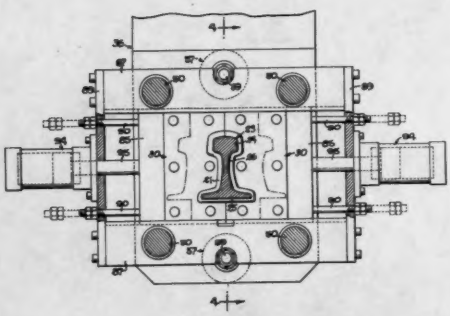
A metal-piercing press. The press is of the type having a piercing operation centerline, an auxiliary operation centerline parallel thereto, and piercing means and auxiliary means disposed on the respective centerlines. A single container is adapted to be moved between said centerlines. The container is provided with piercing preparatory means having piercing-tool-attaching means adapted to be brought into alignment with the piercing operation centerline when the container holder is in alignment with the auxiliary operation centerline.

3,597,958

MACHINE FOR REMOVING THE BEAD FROM THE JOINT OF A WELDED RAILWAY RAIL

Maurice J. Gross, Rockford, Ill., assignor to Rock-Mill, Inc., Rockford, Ill.

Filed Feb. 4, 1969, Ser. No. 796,527
Int. Cl. B21d *31/00*, *7/06*, *13/00*
U.S. Cl. 72—331 17 Claims



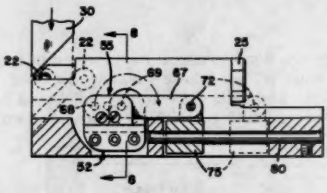
Combined die and shearing members are shifted toward one another and into pressing engagement with opposite end faces of the bead to deform and reduce the cross section of the latter adjacent the joint while applying a compressive force to the rail to improve the quality of the weld at the joint. Thereafter, the members re shifted in unison in one direction along the rail to shear through the bead area of reduced cross section to cut the bead away from the rail. Finally, the members are retracted laterally away from the rail to tear the detached bead into two pieces and to pull the pieces away from the rail.

3,597,959

STOCK FEEDER

Arthur F. Leis, c/o A. F. Leis Co., Inc., 4316 Webster St., Dayton, Ohio

Filed Apr. 8, 1969, Ser. No. 814,281
Int. Cl. B21d *43/10*; B65h *17/26*
U.S. Cl. 72—419 14 Claims



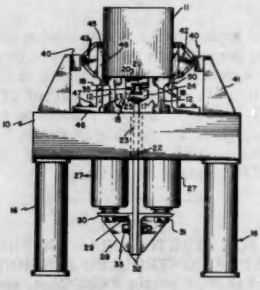
A strip of metal is intermittently advanced into a metal forming or punching machine by a reciprocating gripper which moves in simple harmonic motion between predetermined limits in response to uniform movement of an actuating member operated by a reciprocating press member. The limits of movement of the gripper can be precisely adjusted without changing the sinusoidal movement of the gripper.

3,597,960

HIGH INTENSITY MECHANICAL SHOCK TESTING MACHINE

John M. Otera, Palos Verdes Peninsula; James R. Dowling, Monterey Park, and Rudolph V. Mendoza, Monterey Park, all of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 14, 1969, Ser. No. 799,280
Int. Cl. G01n *3/08*, *29/00*
U.S. Cl. 73—12 9 Claims



A mechanical shock testing machine for shock testing an object with high intensity forces over a wide frequency spec-

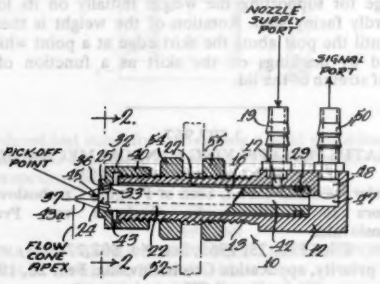
trum. The machine includes a test platform connected to a rigid support by a pair of columns having a predetermined mechanical resonance. These columns provide a restraining force. The shock is applied by exerting a large force on an extruded piece of metal having a predetermined yield point and having a reduced central portion defining a rupture area. By applying sufficient force to the extruded metal piece until it breaks, a predetermined force of short duration is applied to the test platform. The platform now vibrates in accordance with the mechanical resonance of the system. The system may be damped by applying a damping force to the platform.

The invention herein described was made in the course of or under a contract or subcontract thereunder with the Department of the Air Force.

3,597,961
FLUID OPERATED SENSING DEVICE

Carlos D. Pinkstaff, Hammond, Ind., assignor to I-T-E Imperial Corporation

Filed July 26, 1968, Ser. No. 748,047
Int. Cl. G01b *13/12*
U.S. Cl. 73—37.5 **16 Claims**

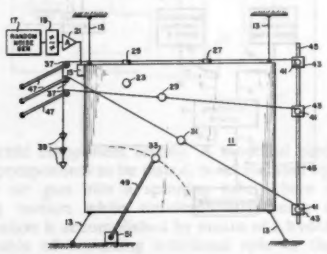


A sensor for sensing the presence of an object or an opposed fluid jet which operates on air or other gases including a nozzle for directing supply fluid in a generally conical flow pattern and a pickoff or sensing passage opening within the conical flow adapted to sense pressure increases therein when the flow pattern in resisted or interrupted.

3,597,962
TRAVELING-TRANSDUCER METHOD OF MEASURING CROSS CORRELATION

Leslie C. Holtz, W. Hyattsville, Md.

Filed Nov. 26, 1968, Ser. No. 779,002
Int. Cl. G01h *1/00*
U.S. Cl. 73—71.4 **9 Claims**

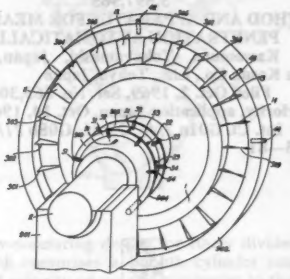


An arrangement for investigating the behavior of vibration in structures in a continuous manner rather than at discrete points. A plurality of reference and traveling transducers are positioned magnetically on a body which is subjected to vibration. As each traveling transducer is moved continuously, its output is correlated with that of the reference transducer and the resulting correlation function plotted, displayed, or recorded. The readouts of several transducers may be correlated with one or more appropriate reference transducers and recorded on a precision multichannel recorder.

3,597,963
APPRATUS FOR SWITCHING PULSES IN MEASURING THE VIBRATION OF ROTATING PARTS DURING OPERATION OF A MACHINE

Jaromir Smejkal, Plzen; Miroslav Jindra, Malesice, and Zdenek Brezina, Stary Plzenec, all of, Czechoslovakia, assignors to Skoda, oborovy podnik, Plzen, Czechoslovakia

Filed July 25, 1969, Ser. No. 844,900
Int. Cl. G01h *11/00*
U.S. Cl. 73—71.4 **8 Claims**

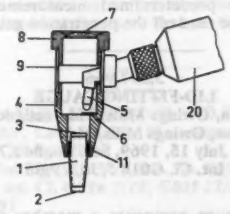


A plurality of measuring pickups, reference pickups and auxiliary pickups are mounted on stationary parts of a machine. Parts to be measured are mounted on a rotating part of the machine. Reference elements and auxiliary elements are mounted on the rotating part. Each part to be measured induces a pulse in each measuring pickup as they pass each other. Each reference element induces a pulse in each reference pickup as they pass each other. Each auxiliary element induces a pulse in each auxiliary pickup as they pass each other. When an output pulse from a measuring pickup coincides with a pulse from a corresponding reference pickup an output pulse is produced which is supplied to a corresponding input of a switching circuit. The output pulse from each auxiliary pickup is supplied to a control circuit to control the switching circuit so that output pulses of a specific amplitude corresponding to one rotating part to be measured are supplied to one and the same output of the switching circuit.

3,597,964
DEVICE FOR TESTING BY APPLANATION

Helmut Heine, Herrsching, Upper Bavaria, Germany, and Joergen Bruun Jensen, Slagelse, Denmark, assignors to Optotechnik G.m.b.H. and Propper Manufacturing Company Inc.

Filed Feb. 18, 1969, Ser. No. 800,192
Claims priority, application Germany, Mar. 8, 1968, P 1 66 896.0
Int. Cl. A61b *3/16*
U.S. Cl. 73—80 **3 Claims**



A device for testing intraocular pressure by applanation. The device includes a testing body of precisely determined

weight which has a bottom end surface adapted to rest directly on the cornea so that as the result of the weight of this testing body a flattened area will be provided between the bottom end surface of the testing body and the cornea. This testing body is held and guided in such a way that no appreciable frictional forces are encountered when it rests upon the cornea. By way of a suitable illuminating means and indicating means it is possible to view the flattened cornea area and to make a comparison which will determine whether or not the intraocular pressure deviates from a given normal value.

3,597,965
METHOD AND APPARATUS FOR MEASURING PENETRATION AUTOMATICALLY

Toshihiko Kawamura, Tokuyamashi, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1969, Ser. No. 863,304
Claims priority, application Japan, Oct. 14, 1968, 43/74198
Int. Cl. G01n *3/48, 25/02;* **G08b** *21/00*
U.S. Cl. 73—81 **2 Claims**

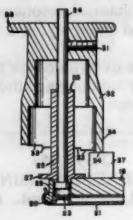
Method and apparatus for measuring penetration of pasty materials, such as petroleum asphalt. The apparatus consists of a measuring needle and standard weight associated with a penetration gauge. The needle and weight are fixedly attached to the stem of the penetration gauge then the combination is movable in the vertical direction by an elastic yarn. The entire operation is controlled by a timer so as to eliminate human errors in the measurement process. First the needle, weight and stem are raised by vertical motion of the yarn to a predetermined point. The position of the needle, weight and stem cause the penetration guage pointer to indicate slightly greater than a zero reading. This position is sensed by photoelectric means which stops the upward motion of the yarn, needle, weight and stem. At the same time a worktable carrying the sample to be measured contact the needle a shock is transmitted through the needle to the stem causing the pointer of the penetration guage to move to the zero reading position and at the same time expose one of the photoelectric cells. This stops the upward motion of the worktable and through the action of a timer releases the needle, weight and stem for the penetration measurement. At the end of the predetermined measurement phase the penetration can be read off the penetration gauge dial.

3,597,966
LID-FITTING GAUGE

Albert A. Heyman, Owings Mills, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed July 15, 1969, Ser. No. 841,793
Int. Cl. G01b *5/30, 19/08*
U.S. Cl. 73—88 **13 Claims**

A lid-fitting gauge comprises a member supported in a horizontal position having an annular beaded edge to simulate the beaded edge of a cup. The member has a vertical opening through which a plunger is disposed. The rotatable plunger carries a weight which has a skirt and to which it is secured, the lower edge of which slopes and is provided with graduated index marks. In one form of the invention the sloping edge comprises a series of vertically stepped downwardly facing shoulders. In another form it is simply a gradually sloping helical edge. A post is secured to the disc below the

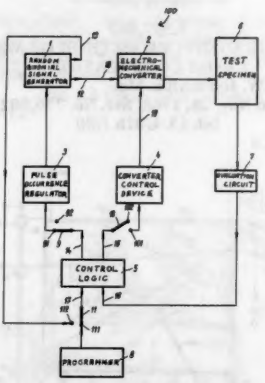


skirt edge for supporting the weight initially on its lowest downwardly facing step. Rotation of the weight is then effected until the post abuts the skirt edge at a point which is evaluated by markings on the skirt as a function of the degree of stretch of the lid.

3,597,967
APPARATUS FOR APPLYING RANDOM MECHANICAL LOADS TO A TEST SPECIMEN

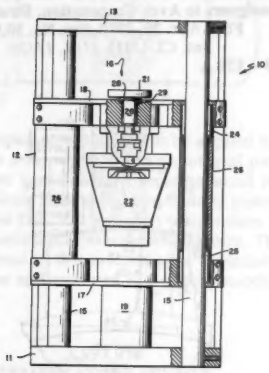
Jan Drexler, and Jan Havel, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 25, 1969, Ser. No. 802,276
Claims priority, application Czechoslovakia, Feb. 26, 1968, 1473
Int. Cl. G01n *3/36*
U.S. Cl. 73—91 **6 Claims**



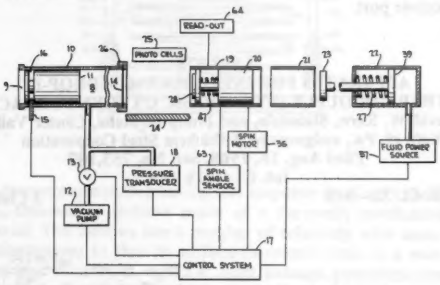
An improved flexible fatigue testing apparatus for stressing a specimen yields a probability density of stress load amplitudes that is controlled in accordance with a random binomial pulse sequence having a variable probability of pulse occurrence and/or a variable pulse repetition rate. Analog control voltages uniquely corresponding to the pulse patterns occurring during successive test intervals operates a hydraulically driven ram coupled to the specimen. The ram imparts to the specimen a load having an amplitude determined by the then-occurring control signal.

3,597,968
ROCKET ASSISTED PROJECTILE-SPIN STATIC FIRING STAND
James W. Bon, Margate, Fla.
Filed Nov. 21, 1969, Ser. No. 878,736
Int. Cl. G01l 5/12
U.S. Cl. 73—117.4 2 Claims



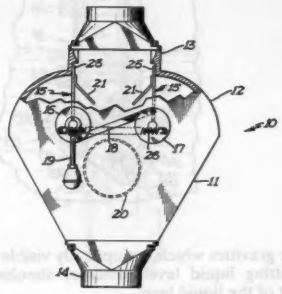
A thrust test stand for spin testing a solid propellant motor in which the spin drive motor is isolated from the thrust of the propellant motor.

3,597,969
DYNAMIC TESTER FOR PROJECTILE COMPONENTS
Herbert D. Curchack, Rockville, Md.
Filed Feb. 2, 1970, Ser. No. 7,929
Int. Cl. G01m 19/00
U.S. Cl. 73—167 6 Claims



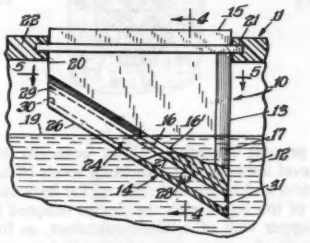
Projectile component testing. A modified projectile, containing components to be tested, is accelerated by means of a vacuum air gun into a spinning tube where it is set in spinning motion while simultaneously being decelerated. Deceleration is accomplished by means of a hydraulic mitigator capable of imparting rotational spin to the projectile while applying a predetermined rate of deceleration. The system is designed for rapid production line testing by means of a control system which starts the spin tube in motion and releases the projectile when a predetermined pressure has been established within the air gun. The control system also terminates the spin and actuates a fluid operated component to replace the mitigator to its start position within the spin tube. In order to provide a check on the polarity of power supplies being tested, a spin angle sensor is provided to transmit a signal for release of the projectile only when the spin tube is in a predetermined angular orientation.

3,597,970
GRANULAR SOLIDS FLOWMETER
William R. Carter, 5021 Wooddale Lane, Minneapolis, Minn.
Filed Apr. 13, 1970, Ser. No. 27,920
Int. Cl. G01f 1/00
U.S. Cl. 73—194 M 8 Claims



A mass flow-measuring device for finely divided solids is provided which comprises a smooth cylinder rotating at a predetermined velocity on an axis transverse to the direction of flow of the falling solids. The change in required power to maintain the predetermined velocity when material is flowing over the power required when the cylinder is rotating freely provides the measure of flow.

3,597,971
COMBINED LEVEL INDICATOR AND HYDROMETER
Walter Erlenbach, Hoffman Estates, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 855,817
Int. Cl. G01n 9/18; G01f 23/02
U.S. Cl. 73—291 7 Claims

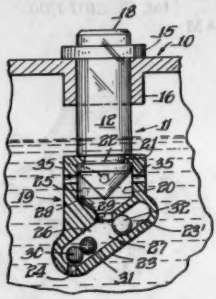


An optical liquid level indicator having a wedge-shaped transparent platelike light transmitting member for receiving and transmitting light to visually provide an observer a determination of liquid level in a container and hydrometer, in the form of an open access chamber containing one or more controlled density balls, so arranged relative to the indicator that it will simultaneously provide a direct readout through the indicator to the observer as to the condition of the specific gravity of the liquid at the same time as the checking of its level.

3,597,972
COMBINED LEVEL INDICATOR AND HYDROMETER
Francis E. Ryder, Lake Zurich, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 855,917
Int. Cl. G01n 9/18; G01f 23/02
U.S. Cl. 73—291 7 Claims

A liquid level indicator and hydrometer for use in determining the liquid level of a fluctuating liquid as well as determining simultaneously the specific gravity thereof. The device contemplates a hollow body operatively mounted on

the lower extremity of a light-transmitting liquid level indicator with a plurality of colored float means having differing



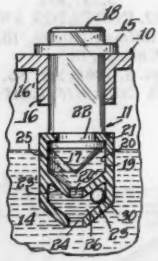
specific gravities which are optically visible through the light-transmitting liquid level indicator simultaneously with the readout of the liquid level.

3,597,973

COMBINED LEVEL INDICATOR AND HYDROMETER

Francis E. Ryder, Lake Zurich, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 8, 1969, Ser. No. 855,928
Int. Cl. G01n *9/18*; G01f *23/02*
U.S. Cl. 73—291 **9 Claims**



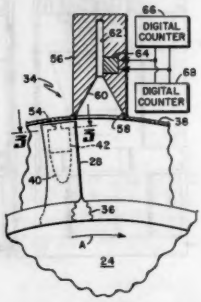
The present invention relates generally to a combined liquid level indicator for indicating levels of liquid subject to fluctuation and hydrometer means for indicating the specific gravity of the liquid with the device adapted to be mounted in the upper wall of a liquid container, as for example the upper wall of a conventional storage battery. The embodiments of the invention disclosed in the present application include a visual liquid level indicating device having a reflecting surface at the inner end of a transparent body member and the upper end of the transparent body member is adapted to the concentrate light rays reflected from the inner end of the body member from different positions. The liquid level indicator is provided with a groove at its lower end and adapted to receive a pair of identical halves of the hollow body section of the hydrometer means. In another embodiment the hollow body section of the hydrometer means comprise two identical halves which are hinged together to accept a grooved indicator and having a female and male fastening means on the respective halves. The hydrometer means of the various embodiments are provided with chamber means and means for admitting liquid thereto and indicating ball float means operatively mounted within the chamber means for indicating the specific gravity of the liquid within which the hydrometer means is inserted. The different chamber means of the various embodiments comprise substantially parallel and inclined walls between which the indicating ball float means is operatively mounted for indicating the specific gravity of the liquid. When the liquid level of the battery or radiator with which the combined liquid level indicator and hydrometer means is utilized covers the end of the indicator one will obtain a normal black or dark pattern at the upper end. If the specific gravity is low, the orange or red colored ball will not float and will drop down and provide an indicia at the end of the indicator.

3,597,974

FLUIDIC TEMPERATURE SENSOR FOR GAS TURBINE ENGINES

Jay I. Black, Orange, and Robert A. Hatch, Stratford, both of, Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Apr. 20, 1970, Ser. No. 30,035
Int. Cl. G01k *1/14, 11/26*
U.S. Cl. 73—339 A **10 Claims**



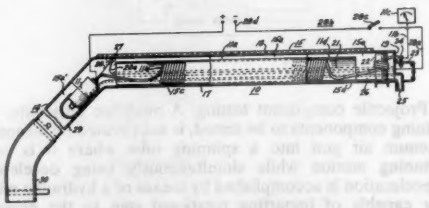
The disclosure illustrates a fluidic temperature sensor comprising a fluidic oscillator mounted in a blade of the turbine assembly of a gas turbine engine. The oscillator has an inlet which receives hot gas through which the blade rotates. An open-ended signal output tube extends from the oscillator to the periphery of the blade. A generally conical stationary receiver port is positioned in a circumferential shroud which surrounds the turbine blade and receives the pressure oscillation signals emanating from the fluidic oscillators in the blade. The period of response for the oscillator is selected so that the resultant pressure frequency signal at the receiver port is an average of the temperature of the gas through which the blade passes in between successive passes over the receiver port.

3,597,975

APPARATUS FOR INTRODUCING A DROP-IN THERMOCOUPLE INTO A BASIC OXYGEN FURNACE

David W. Kern, Slatedale, and Philip D. Stelts, Center Valley, both of, Pa., assignors to Bethlehem Steel Corporation

Filed Aug. 16, 1968, Ser. No. 753,187
Int. Cl. G01k *1/08*
U.S. Cl. 73—343 **3 Claims**



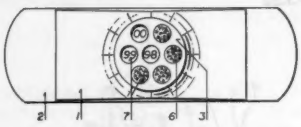
An apparatus for introducing a drop-in thermocouple into a molten ferrous bath in a basic oxygen furnace, said apparatus includes a combination closed-compartmentized holding box and charging chute. Each compartment of the box is provided with a restraining means, anchoring means, means for introducing a coolant gas therein and means for electrically connecting the thermocouple cable to an outside recording device. The charging chute includes a wide holding portion whose sides converge to form a restricted funnellike charging portion by which the thermocouple is guided downwardly into the furnace.

3,597,976

CLINICAL TEMPERATURE BANDAGE

Paul J. Fryar, 4359 Rutgers Ave., Long Beach, Calif.

Filed July 3, 1969, Ser. No. 839,809
Int. Cl. G01k 11/08
U.S. Cl. 73—358 4 Claims



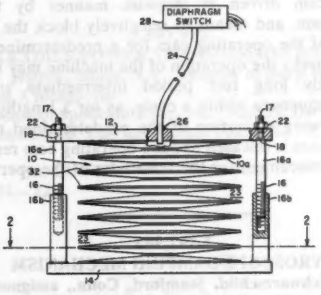
A Clinical Temperature Bandage to be applied to the skin, usually under the arm, which has as an integral part thereof, a chemical holder containing, in separate small recesses, a plurality of chemicals having different melting points, each of which will become fluid at a different temperature thus making possible the estimation of body temperature. The plurality of chemicals used in this invention are essentially pure 2-ethoxy napthalene and mixtures of 2-ethoxy napthalene and lauric acid.

3,597,977

TEMPERATURE SENSOR

Stephen J. Zierak, Westwood, Mass., assignor to Metal Bellows Corporation, Sharon, Mass.

Filed Sept. 19, 1969, Ser. No. 859,359
Int. Cl. G01k 5/42; H01h 37/36
U.S. Cl. 73—368.7 10 Claims



A temperature sensor having fast response employs a fluid-tight, thin-walled bellows made of a thermally conductive material. The bellows has a number of relatively wide annular diaphragms so that its surface-to-volume ratio is a maximum and it is held rigid. A fluid passage communicates between the interior of the bellows and the device to be actuated and the bellows and passage are filled with an expansible fluid. When the bellows is subjected to a heated medium, heat is immediately conducted to substantially all of the fluid which expands rapidly through the passage and actuates an associated pressure responsive device.

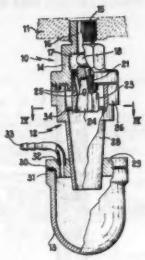
3,597,978

DEVICE FOR SAMPLING LIQUIDS FROM VACUUM OPERATING EQUIPMENTS

Francesco Siclari; Franco Magnoni, and Battista Morandi, all of Cesano Maderno, Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa, Milan, Italy

Filed Dec. 11, 1969, Ser. No. 884,244
Claims priority, application Italy, Dec. 30, 1968, 25702/68
Int. Cl. G01n 1/14
U.S. Cl. 73—422 R 7 Claims

A device for sampling liquids from reaction equipments and particularly from vacuum operating reaction equipments, comprising a body fixedly secured to the bottom of the equipment and having an outlet duct fitting with a check valve, which movable component is kept closed by the atmospheric pressure. A movable assembly, comprising a sampling container and a feeding duct therefor, may be sealingly connected with said body in such a manner as to mechanically control the engagement of said check valve movable component with a related seat, means being provided to reach a given vacuum value in said container and said feeding duct.

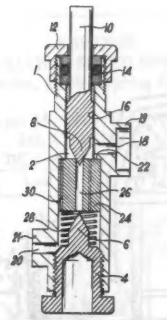


3,597,979

METERING VALVE FOR INTRODUCING A FLUID UNDER PRESSURE INTO AN ANALYTICAL APPARATUS

Etienne Bonnet, Boussens, France, assignor to Entreprise de Recherches et d'Activites Petrolieres (ELF), Paris, France

Filed Apr. 6, 1970, Ser. No. 25,730
Claims priority, application France, Apr. 10, 1969, 6910998
Int. Cl. G01h 1/00
U.S. Cl. 73—422 9 Claims



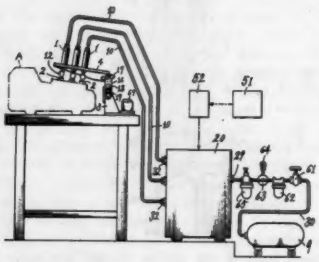
Metering valve in which the metering volume is defined within a passage which is pierced in a movable slide-block and closed by a stationary pintle and a movable pintle. The slide-block is urged towards the movable pintle by an elastic system and is stopped by an abutment so that the movement of withdrawal of the movable pintle has the effect of opening the metering passage in proximity to the stationary pintle and permits the discharge of the fluid dose, then puts the passage into communication with the inlet.

Ducts for the flow of a scouring fluid are pierced in the slide-block around the metering passage and are closed by the abutment during introduction of the fluid to be metered.

3,597,980
GRAIN PROBE
Edmund Beuker, Melfort, Saskatchewan, Canada
Filed July 8, 1969, Ser. No. 839,911
Int. Cl. G01n 1/16
U.S. Cl. 73—425.2 2 Claims

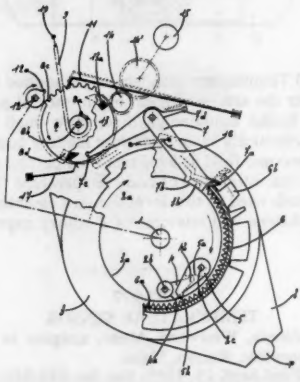
A grain probe according to the invention consists of a sampling tube having a closed lower end, and a series of openings spaced along the length of the tube on one side, each opening being shaped so as to prevent loss of grain through the openings when the tube is in its normal upright position.

3,597,981
KEYBOARD-TESTING DEVICE FOR CALCULATING MACHINE OR THE LIKE
Hiroyoshi Wakabayashi, and Yousuke Fukui, both of Osaka-shi, Japan, assignors to Asahi Automatic Machine-Tool Works Co., Ltd., Osaka-shi, Japan
Filed Oct. 14, 1969, Ser. No. 866,347
Claims priority, application Japan, Oct. 15, 1968, Nov. 7, 1968, 43/75161;43/81793
Int. Cl. G01m 19/00
U.S. Cl. 73—432 3 Claims



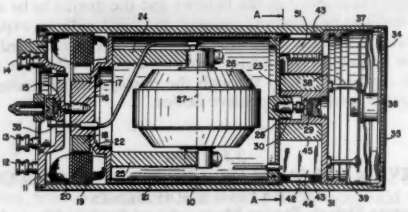
A keyboard-testing device for a calculating machine having keys on its keyboard or the like. A plurality of air cylinders are mounted on a panel board just above the keyboard of the calculating machine to be tested so as to depress any one of the keys. A plurality of control valves are connected to the respective air cylinders so as to supply and cut off compressed air from a compressor. An order system and electric control means is provided for controlling the operation of each of said control valves.

3,597,982
PROGRAMMERS
Jean Jullien-Davin, Valence, France, assignor to Crouzet, Paris, France
Filed June 9, 1969, Ser. No. 831,367
Claims priority, application France, June 13, 1968, July 4, 1968, 753; 158220
Int. Cl. G05g 5/02
U.S. Cl. 74—3.52 3 Claims



A programmer for automatic washing machines or the like, including a constant-speed reversing programming cam, an operating cam driven in stepwise manner by the programming cam, and means to selectively block the stepwise advancing of the operating cam for a predetermined length of time, whereby the operation of the machine may include a comparatively long rest period intermediate successive operating sequences within a cycle, as for a lengthy soaking stage. Following expiration of the predetermined time, the blocking means is released and the operating cam resumes its stepwise advancement for the remainder of the operating cycle.

3,597,983
GYROSCOPE DAMPING MECHANISM
Gunter J. Schwarzschild, Stamford, Conn., assignor to The United States Time Corporation, Waterbury, Conn.
Filed Feb. 24, 1969, Ser. No. 801,696
Int. Cl. G01c 19/04; G01d 11/14
U.S. Cl. 74—5.5 4 Claims



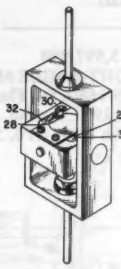
A gyroscope includes a motor-driven rotor mounted on a rotatable gimbal. The gimbal has paddles which pump a fluid through controlled orifices for damping of the gimbal. A temperature-responsive bellows is connected to a plurality of valve plungers which move within the orifices to control their effective size.

3,597,984

GYROSCOPE CONTROL DEVICE

Henry P. Lichte, Jr., Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.

Filed May 1, 1968, Ser. No. 725,664
Int. Cl. G01c *19/50*
U.S. Cl. 74—5.43 4 Claims



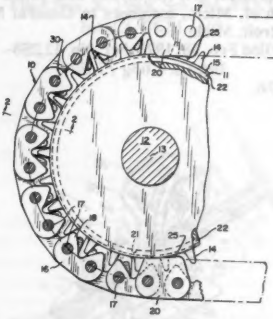
Utilizing air current generated by the rotating spinner of a gyro for stabilizing the position of the rotor relative to the outer gimbal of the gyro. An opening is formed in the rotor cover, which permits the escape of air from the rotor housing, and directs such air against a baffle element which is mounted on the rotor housing. Such air currents impinging upon the baffle generate a torque in a plane perpendicular to the spin axis of the rotor, thus generating a precessing torque for urging the rotor housing towards a position perpendicular to the outer gimbal.

3,597,985

FLEXIBLE POWER TRANSMISSION DRIVE

Joseph O. Jeffrey, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of application Ser. No. 782,859, Dec. 11, 1968, now abandoned. This application Feb. 5, 1970, Ser. No. 7,403
Int. Cl. F16h *7/00, 55/30;* F16g *13/02*
U.S. Cl. 74—229 8 Claims



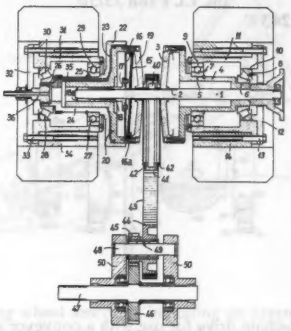
For the purpose of illustrating the present invention, a flexible power transmission drive is disclosed herein which includes a flexible band that can be a chain, a belt, or the like, which is adapted to drivingly encircle and engage a sprocket. The sprockets and cooperating band structures disclosed herein have a mismatched pitch and are provided with complemental engaging surfaces to provide a smooth transitional engagement between the band and the sprocket and to cause the band to move with the sprocket along a constant sprocket-pitch radius.

3,597,986

FRICTION-RING VARIABLE-SPEED TRANSMISSION MECHANISMS

Pierre Bouthors, Quemerais, Philippe, Billancourt, France, assignor to Regie Nationale Usines Renault, Billancourt (Hauts de Seine) France and Automobiles Peugeot, Paris, France

Filed Mar. 18, 1970, Ser. No. 20,513
Claims priority, application France, Mar. 24, 1969, 69/08575
Int. Cl. F16h *55/52, 15/00, 9/00*
U.S. Cl. 74—230.17 F 2 Claims



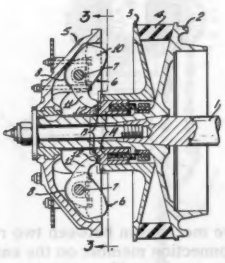
Friction-ring variable-speed transmission mechanism comprising parallel input shaft and output shafts, the input shaft carrying a pair of frustoconical plates having interposed therebetween a ring member adapted to coact with said plate through corresponding friction surfaces, one plate being adapted to move axially under adequate control means, this variable-speed transmission mechanism being characterized in that said rings are formed with external teeth, and that said teeth are drivingly connected through a meshing flexible member to corresponding teeth formed on a twin pinion mounted for free rotation on a support movable about the output shaft, the other set of teeth of this twin pinion meshing with those of a pinion rotatably solid with said output shaft, the change in the transmission ratio being obtained by causing a controlled angular displacement of said movable support.

3,597,987

VARIABLE SPEED SHEAVE

Elmer Carl Kiekhaefer, 2408 Cypress Gardens Road, Winter Haven, Fla.

Filed Apr. 25, 1969, Ser. No. 819,178
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 E 5 Claims



A variable speed sheave employing centrifugal flyweights actuating an axially movable sheave half, utilizes a replaceable washer to take the thrust of the weights, and offsetting or skewing the flyweights to avoid fixed wear tracks under the cams of the flyweights engaging the washer. A die-cast

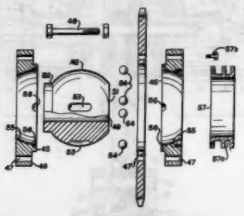
replaceable bushing is employed to support the flyweight pintals and thereby avoid expensive machining of the bearing parts. Six circumferentially spaced positions are provided for flyweights whereby either two, three, four or six flyweights may be employed without disturbing the dynamic balance of the sheave.

3,597,988

SELF-ALIGNING SPROCKET

Herbert G. Hecketsweiler, Florence, Colo., assignor to Portec, Inc.

Filed Oct. 27, 1969, Ser. No. 869,593
Int. Cl. F16h *55/30*
U.S. Cl. 74—243 C **21 Claims**



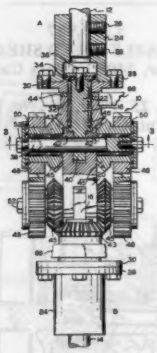
A sprocket-chain drive for use with a conveyor system having a straight conveyor belt and a conveyor belt turn and including an adjustable sprocket to operatively connect the shafts of the straight conveyor and turn which do not lie in spaced parallelism. The adjustable sprocket, mounted upon a spherical head secured to the shaft, is adapted to tip out of the plane of the normal of the shaft to align itself with the chain and other sprocket of the drive. A guide is used to hold the adjustable sprocket in its proper position with respect to the chain.

3,597,989

ANGULAR DRIVE MECHANISM

Everett H. Benson, Rte 1, Box 429, Eagle Creek, Oreg.

Filed Feb. 16, 1970, Ser. No. 11,642
Int. Cl. F16h *35/06, 1/26, 1/48*
U.S. Cl. 74—385 **5 Claims**



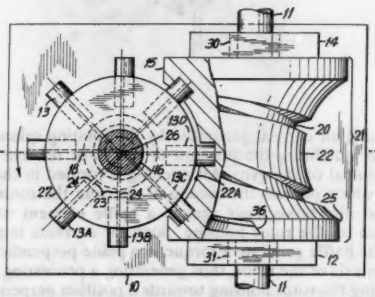
An angular drive mechanism between two rotatable shafts includes a shaft connection member on the end of each shaft which is relatively rotatable with respect to such shaft about the axis of rotation of such shaft. A pivotal connection structure between these shaft connection members includes either one or two pivot elements with axes at right angles to the axes of rotation of the shafts. A bevel gear secured to the end of each shaft is journaled on a shaft connection member and meshes with bevel gears on the opposite ends of a pivot element. A direct drive modification has an intermediate connection member pivotally connected between the shaft connection members by two spaced pivot elements having parallel axes. Spur gears secured to the bevel gears on the respective ends of the pivot elements mesh with each other. A reverse drive modification has a single pivot element. An angular relationship between the longitudinal axes of any two of the connection members about the axis of a pivot element will prevent rotation of the pivotal connection structure about the axis of either shaft.

3,597,990

ZERO-LASH RIGHT-ANGLE MOVEMENT

Joseph P. McCartin, 43-39 158th St., Flushing, N.Y.

Filed May 1, 1970, Ser. No. 33,561
Int. Cl. F16h *1/04, 1/16, 55/10*
U.S. Cl. 74—415 **9 Claims**



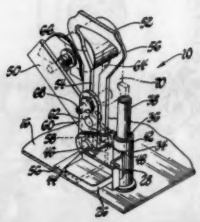
A right angle mechanical power transfer apparatus for transmitting a force from its input to its output consisting of an input rotary member having a contoured thread which is in engagement with an output rotary member having a plurality of offset rotatable members which engage opposite sides of the thread in order to eliminate side motion play or backlash.

3,597,991

TRANSMISSION SELECTOR

James A. McCormick, Jr., Northville, and Julius Hezler, Jr., Bellaire, both of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 18, 1970, Ser. No. 12,253
Int. Cl. G05g *13/00*
U.S. Cl. 74—476 **3 Claims**



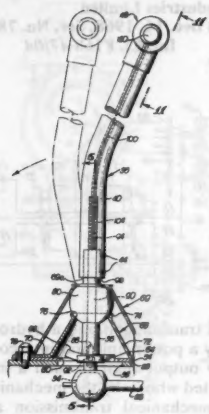
Disclosed herein is a control mechanism including a first manual lever adapted to select one mode of operation and a second manual lever adapted to select another mode of operation and a linkage connecting the two selector levers to prevent simultaneous movement of the two levers. The interconnecting linkage also provides automatic cancellation of the mode selected by the second lever when the first lever is actuated.

3,597,992

REVERSE GEAR LOCKOUT MECHANISM

Dean G. Lowry, Tustin, and Leland K. Lowry, Garden Grove, both of, Calif., assignors to Deano Dyno-soars, Inc., Santa Ana, Calif.

Filed Aug. 6, 1969, Ser. No. 848,017
Int. Cl. F16h 57/06
U.S. Cl. 74—476 5 Claims



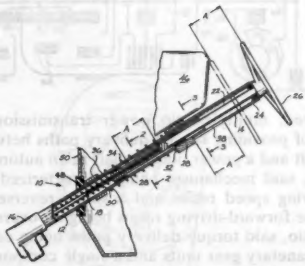
A manual transmission reverse gear lockout mechanism for a rear drive vehicle. The reverse gear lockout mechanism on the gear shift lever is spring loaded to override the shift lever's normal forward gear position, and is activatable by finger control means on the shift lever.

3,597,993

COLLAPSIBLE STEERING COLUMN MOUNT ARRANGEMENT

Marion M. Ripley, 19 Compass Road, Baltimore, Md.

Filed Nov. 4, 1969, Ser. No. 873,789
Int. Cl. B62d 1/18
U.S. Cl. 74—492 4 Claims



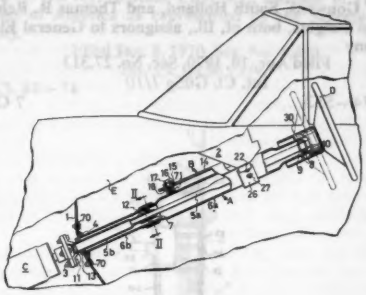
A safety steering column mount arrangement for motor vehicles arranged to collapse upon an impact is provided. The lower and upper sections of the housing and the lower and upper sections of the steering shaft are each telescopic and separately bias with compression coiled springs.

3,597,994

STEERING DEVICE WITH ENERGY ABSORBER

Masanao Shiomi, Toyota-shi, and Tadataka Narumi, Kariya-shi, both of, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Sept. 30, 1969, Ser. No. 862,254
Claims priority, application Japan, Oct. 5, 1968, 43/72548
Int. Cl. B62d 1/18
U.S. Cl. 74—492 5 Claims



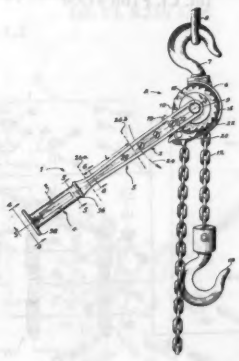
A steering wheel assembly including an extensible steering shaft whose upper end is connected to a steering wheel and the lower end is connected to a gearbox, a tubular steering column also having telescopic portions arranged coaxially about the steering shaft and movable in the axial direction thereof with the shaft, and an energy-absorbing member capable of plastic deformation in one direction only, either under tension or compression, and being rigid in the opposite direction, said energy-absorbing member positioned beside the steering column and fixed at its lower end to a portion of the tubular steering column and fixed at the other end to a portion of the vehicle. Preferably, said energy-absorbing member is mounted at an angle to the axis of the steering shaft so as to kinetically balance an angular collision force and thereby prevent bending of the shaft.

3,597,995

OVERLOAD-PREVENTING HANDLES

Harold V. Hawkins, and Ralph A. Dick, both of Williamsville, N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,555
Int. Cl. G05g 1/04
U.S. Cl. 74—523 8 Claims



A handle of the type adapted to prevent overloading of a mechanism with which it is operably associated, wherein a significant length of the handle is designed such that all

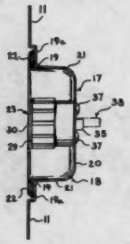
points lengthwise thereof will simultaneously experience the same bending stress when a mechanism-operating load is applied to the handle, thereby resulting in a noticeably bending deformation of the length of handle before failure of the handle.

3,597,996

RECESSED CONTROL KNOB FOR COOKING EQUIPMENT

Harry A. Gouwens, South Holland, and Thomas R. Rehberg, Chicago Heights, both of, Ill., assignors to General Electric Company

Filed Apr. 10, 1970, Ser. No. 27,313
Int. Cl. G05g *1/10*
U.S. Cl. 74—553 **7 Claims**



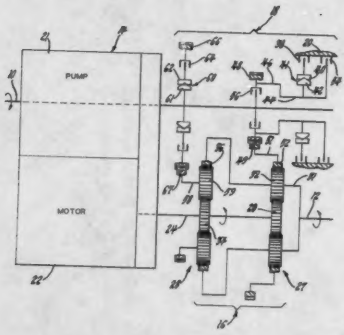
A recessed control knob assembly, preferably for use with commercial cooking equipment having a control panel, including a generally cup-shaped skirt positioned in a suitable recess provided therefor in the control panel, the cup-shaped skirt having a base with outwardly and forwardly sloping sidewalls terminating in an annular flange, the base of the skirt having a knob secured thereto which projects forwardly thereof but which is entirely contained within the skirt with the forward end surface of the knob displaced slightly inwardly of a plane defined by the annular flange of the skirt so that the knob is protected against accidental jarring, suitable indicia being stamped or otherwise marked upon the annular flange of the skirt, and the knob being attached to a suitable thermostat or control, the knob and skirt being manually rotatable as a unit relative to the control panel.

3,597,997

HYDROMECHANICAL TRANSMISSION

Ronald L. Phillips, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 30, 1970, Ser. No. 23,573
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **6 Claims**



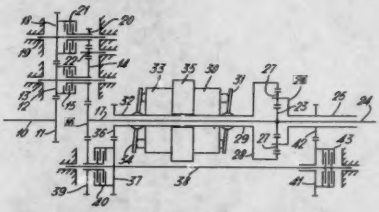
A hydromechanical transmission having a variable-ratio hydrostatic drive unit, two planetary gearsets and a plurality of drivemestablishing devices including a one-way brake and a one-way clutch combined to provide three forward speed range drives and a reverse speed range drive with each such drive established by engagement of only one drive-establishing device and with the one-way devices permitting the lower speed range drive-establishing devices to remain operational in higher forward speed ranges.

3,597,998

POWER TRANSMISSION MECHANISM

Heinrich Ebert, Furth, Bavaria, Germany, assignor to David Brown Gear Industries Limited

Filed Dec. 16, 1968, Ser. No. 783,888
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **12 Claims**



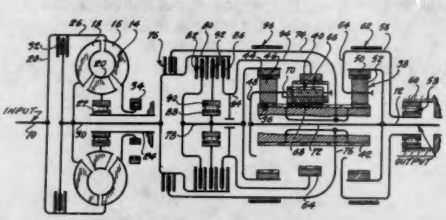
A mechanical transmission and a hydrostatic transmission both drivable by a power unit and interconnected to drive a common hollow output shaft in such a manner that torque may be transmitted wholly by the mechanical transmission or partly by the mechanical transmission and partly by the hydrostatic transmission in varying proportions or wholly by the hydrostatic transmission, and a power takeoff shaft drivably connected to the power unit coaxial to both the input shaft and the hollow output shaft.

3,597,999

EXTREME RATIO OVERDRIVE POWER TRANSMISSION MECHANISM

Alan R. Fisher, Highland Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1969, Ser. No. 878,721
Int. Cl. F16h *47/08, 57/10*
U.S. Cl. 74—688 **6 Claims**



A geared, multiple-ratio power transmission mechanism capable of providing torque delivery paths between a power input shaft and a power output shaft in an automotive vehicle driveline, said mechanism being characterized by four forward-driving speed ratios and a single reverse speed ratio, one of the forward-driving ratios being an overdrive with extreme ratio, said torque delivery paths being defined by two simple planetary gear units and a single compound planetary gear unit, said gear units having elements common to each other.

3,598,000

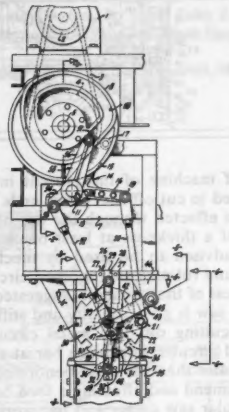
INDEX ASSEMBLY

Konrad Emil Meissner, Lafayette, Calif., assignor to Filper Corporation, San Ramon, Calif.

Filed May 15, 1969, Ser. No. 824,789
Int. Cl. B23b *29/32*
U.S. Cl. 74—822 **2 Claims**

An index assembly including a camshaft continuously driven at a uniform rate, having an index-actuating cam and

an index-locking cam secured thereon, and an indexing disc is secured on a work shaft that is separate from said camshaft. Said indexing disc is formed with radially outwardly opening equally spaced recesses, and separate index-moving and index-locking elements or plungers operatively connected with said index-actuating cam and with said index-locking cam, respectively, for positive reciprocable movement into and out of separate of said recesses and for rotation of said indexing disc and work shaft through part of each 360° rotation of said camshaft under the influence of movement of said index-actuating cam and movement of said



index-locking cam, said indexing disc being positively engaged by said index-moving and index-locking plungers against movement relative to said disc circumferentially of the latter in either of two opposite directions when in engagement with the latter. A control member connects the separate operative connections between said index-actuating cam and said index-moving plunger, and between said index-locking cam and said index-locking plunger, for simultaneous opposite reciprocable movement of said plungers into and out of said recesses under the influence of movement of said index-locking cam to insure alternate locking and release of said indexing disc.

3,598,001
REVERSIBLE RATCHET HANDLE FOR SOCKET WRENCH

Harvey A. Thomasian, Northboro, Mass., assignor to Lowell Corporation, Worcester, Mass.

Filed Feb. 14, 1969, Ser. No. 799,421
Int. Cl. B25b *13/46*
U.S. Cl. 81—63.1 **5 Claims**

A socket wrench handle with a reversible ratchet mechanism comprising a pair of U-shaped leaf springs to serve as pawls positioned on opposite sides of a ratchet wheel with a polygonal central opening and symmetrically shaped ratchet teeth and a tiltable reversing lever which can be swung into either one of its two terminal positions to disengage the one or the other of the two springs from the teeth of the ratchet wheel.

3,598,002
WRENCH SET

Joseph G. Garvey, Neptune City, N.J., assignor to The United States of America as represented by the Secretary of the Army.

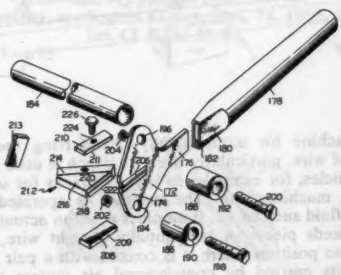
Filed Jan. 8, 1970, Ser. No. 1,480
Int. Cl. B25b *13/48*
U.S. Cl. 81—71 **4 Claims**

A holder and handle for Allen and/or Bristol type wrenches that includes a hollow holder in which several different sized chucks can be held. A different size wrench can be fitted into each chuck which in turn is held firmly in the end of the handle by a knurled threaded nut.

3,598,003
SELECTIVELY ADJUSTABLE REAMER FOR USE WITH A ROTATING PIPE

Donald E. Blake, 761 Chestnut Ridge Road, Morgantown, W. Va.

Division of Ser. No. 627,694, Apr. 3, 1967, Pat. No. 3,445,871.
This application Feb. 18, 1969, Ser. No. 840,552
Int. Cl. B23b *5/16*
U.S. Cl. 82—1.2 **2 Claims**



An apparatus for use in combination with pipe-working tools for the cutting, reaming and threading of pipe of larger

diameters, i.e., diameters in excess of 2 inches and particularly diameters in the range of 2½ inches—6 inches. The apparatus rotatably supports and establishes a driving connection between a pipe and a portable rotary power source such as a power vise and, being so supported and driven, the pipe may be cut, reamed and threaded in one work setup.

The pipe is rotatably supported on a head or platform by means of a roller vise, and the head in turn is rotatably mounted on a stand for rotation about two axes. A tool support arm is carried by the rotatable head and moves in unison with the head upon movement of the head about its axes. An adapter ring and universal joint drivingly connect one end of the pipe to the rotary power source. The universal joint eliminates the need of alignment between the axis of rotation of the pipe and the axes of rotation of the power source and, as the pipe is rotatably driven, the rotatable head moves about its axes in response to any eccentric rotation of the pipe and thereby affords automatic alignment between the rotating pipe and the roller vise.

A conventional pipe cutter is used in combination with the apparatus to cut the pipe, and the pipe is reamed by a novel reamer which can be selectively adjusted to ream pipe of several different sizes. Threading is accomplished by the use of a conventional geared threader.

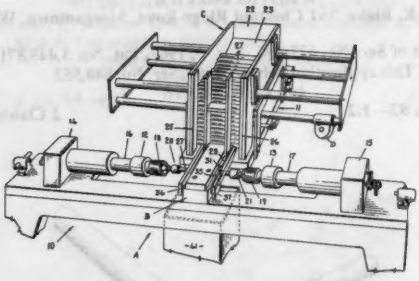
Methods are also provided for the cutting, reaming and threading of pipes of such larger diameters wherein a portable rotary power source such as a power vise may be employed to rotatably drive the pipe. The methods involve establishing a universal driving connection between a pipe to be worked and a rotary power source, rotatably securing the pipe in a vise means supported for rotation about multiple axes, and then rotatably driving the pipe and applying cutting, reaming and threading tools to the portion thereof to be worked. The methods when combined constitute another method of sequentially cutting, reaming and threading a pipe in a single work setup using a portable rotary power source, such as a power vise to rotatably drive the pipe.

3,598,004

AUTOMATIC MACHINE FOR CHAMFERRING WIRE ROD ENDS

John E. Hopkins, 76 Gracefield Avenue, Toronto 389, Ontario, Canada

Filed June 16, 1969, Ser. No. 833,409
Int. Cl. B23b *13/10*
U.S. Cl. 82—2.7 **2 Claims**



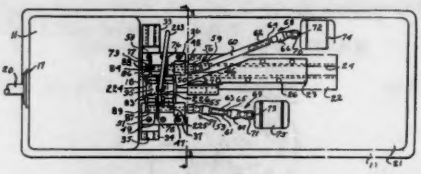
A machine for automatically chamferring the ends of pieces of wire, particularly the wire which is used in making such articles, for example, as wire dishracks for use in dish washing machines, etc. The machine is operated by pressurized fluid such as air. It employs a piston actuated pusher which feeds pieces of substantially straight wire, one-at-a-time, into position where it is coaxial with a pair of spaced apart bits carried by conventional air motors which are reciprocated back and forth to chamfer the wire ends. Valve means actuated by pulsators and also by the reciprocating pusher and air motors carry out the sequence of moving the wire into position, chamferring and releasing the wire and then repeating the operation.

3,598,005

MACHINE TOOLS

Donald S. Shafer, Cincinnati, Ohio, assignor to Watkins Manufacturing Company, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 431,003, Feb. 8, 1965, now abandoned , Continuation of application Ser. No. 460,795, June 2, 1965, now abandoned. This application Dec. 15, 1967, Ser. No. 690,827
Int. Cl. B23b *5/14, 3/04*
U.S. Cl. 82—46 **21 Claims**



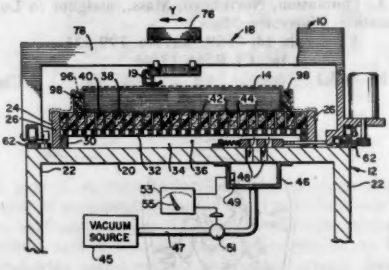
The cutoff machine of the present invention is continuously operated to cut off successive ends of a metal bar, and said cutoff is effected through the use of a toothed circular saw cutter of a thickness at least one-half of the thickness thereof, as advised to be used by mechanical engineering handbooks, and rotating said toothed circular saw cutter at a speed in excess of that presently suggested in said handbooks whereby the saw is given rigidity and stiffness to accomplish the desired cutting off of a metal circular workpiece bar. Rotating said circular workpiece bar at a speed, again, considerably greater than the aforementioned engineering handbooks recommend and effecting a feed between the rotating toothed circular saw cutter and bar workpiece considerably greater than that presently recommended by the aforementioned engineering handbooks. This results in savings in waste material and a material reduction in time per piece produced.

3,598,006

METHOD FOR WORKING ON SHEET MATERIAL AND OTHER OBJECTS

Heinz Joseph Gerber, and David R. Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, East Hartford, Conn.

Division of Ser. No. 821,780, May 5, 1969, Pat. No. 3,495,492. This application Feb. 2, 1970, Ser. No. 7,544
Int. Cl. B26d *7/02*
U.S. Cl. 83—14 **6 Claims**



A method for working on sheet material or other objects uses a vacuum holddown device having a material-supporting surface including a plurality of vacuum openings passing therethrough. A vacuum chamber associated with the supporting surface applies a vacuum through the vacuum openings to the sheet material or other object received thereon. A sheet or panel of substantially air-impervious sheet material, such as a sheet of thin polyethylene, is spread over the exposed surface of the work, and cooperates with the vacuum to draw it toward the supporting surface and into a more compact condition. The air-impervious panel used with the vacuum may be an expendable sheet of such material spread entirely over the surface of the work prior to the

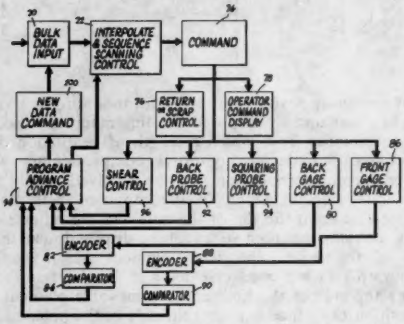
performance of work thereon and/or may be one or two continuous belts of such material located in front of and/or behind the work tool. The vacuum and air-impervious panel may also be used to hold a layup of sheet material to be cut in a compact condition for a long period of time between the laying up process and the cutting process to prevent the various layers of the layup from shifting, flowing or otherwise moving relative to one another so as to depart from their relative positions as initially laid up.

3,598,007

SHEARING METHOD

Ronald S. Williams, Lexington, Ky., and John J. Erhart, Cincinnati, Ohio, assignors to The Cincinnati Shaper Co., Cincinnati, Ohio

Filed Mar. 14, 1968, Ser. No. 713,088
Int. Cl. B26d 3/00
U.S. Cl. 83—36 8 Claims



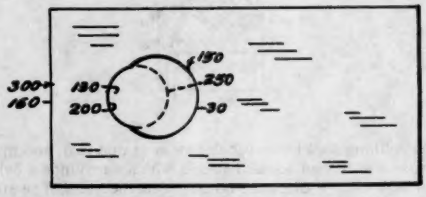
A method of shearing a stated quantity of each of a number of different sized parts from sheet stock wherein the orientation of stock feed alternates in a predetermined pattern, and wherein the parts to be produced are laid out on the stock so that the first two cuts yield a parts blank and at least one cutoff. The parts blank is then sheared into parts, and the cutoff is sheared in two cuts into a second parts blank and the sequence repeated until the starting sheet is consumed.

3,598,008

PROCESS OF MANUFACTURE OF HAMMERMILL HAMMERS

Calvin L. Jacobson, Harlan, Iowa; Robert E. Morken, Crystal, Minn., and Norman C. Silver, St. Louis Park, Minn., assignors to Harlan Manufacturing Company, Inc., Harlan, Iowa

Filed Sept. 17, 1969, Ser. No. 858,679
Int. Cl. B02c 13/00
U.S. Cl. 83—39 3 Claims



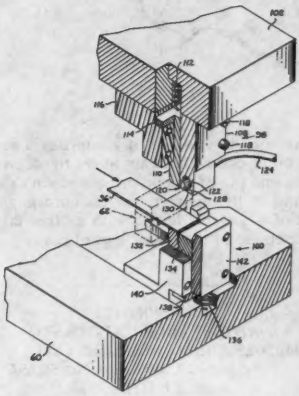
The process of manufacture of a hammermill hammer from a blank which comprises punching the blank with a larger punch to form a hole in the blank into which a cylindrical hammer-supporting rod can be loosely and freely received, and then punching the blank again with a second punch to form a recess in the wall of the hole made in the first punching to form an enlarged finished hole, the second punch having a certain side surface portion in the form of the convex outer surface of the cylinder of the same size as the hammer rod so that a hammer rod passing laterally of itself can pass through said hole from its larger part into the recess for snug engagement with the wall of the recess.

3,598,009

METHOD AND APPARATUS FOR CUTTING, TRANSFERRING AND DEPOSITING SELF-SUPPORTING STRIP MATERIAL

John Jacob Regec, Emporium, Pa., and Henry William Roeber, Waterloo, N.Y., assignors to Sylvania Electric Products Inc.

Filed Feb. 20, 1969, Ser. No. 801,114
Int. Cl. B26d 5/20, 7/06
U.S. Cl. 83—98 1 Claim



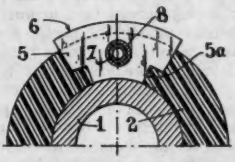
Apparatus and method for performing the title functions with thick film resistor or capacitor material. The material is fed in discrete increments to a cutting head which severs selected portions and transports the same to a remote location where it is deposited across conductors formed on an insulating substrate.

3,598,010

ROTARY CUTTER AND FOLD LINE MARKER

Louis Jean Chambon, Paris, France, assignor to Societe D'Etudes De Machines Speciales Societe Anonyme, Paris, France

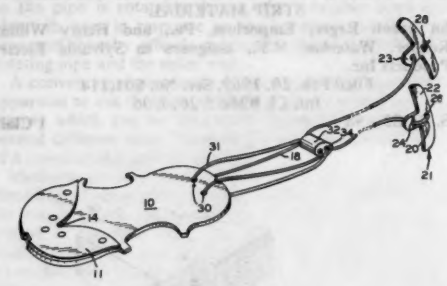
Filed Sept. 9, 1968, Ser. No. 758,455
Claims priority, application France, Sept. 18, 1967, 121,344
Int. Cl. B23d 35/00
U.S. Cl. 83—675 3 Claims



Rotary tool for cutting and/or marking fold lines comprises a cylindrical layer of hard plastic material having embedded

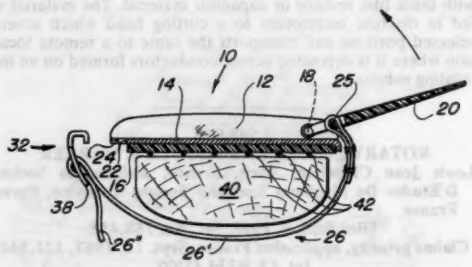
therein at least one metal blade of which the outer edge projects from the outer surface of said plastic layer. The blade is locked in place by a metal bar received in a hole in the blade and aligned bores in the plastic layer on opposite sides of the blade.

3,598,011
STOP FOR CELLO END PIN
Theodore Henkle, 240 Broughton St. West, Savannah, Ga.
Filed Mar. 12, 1970, Ser. No. 18,972
Int. Cl. G10d *1/02*
U.S. Cl. 84—280 **5 Claims**



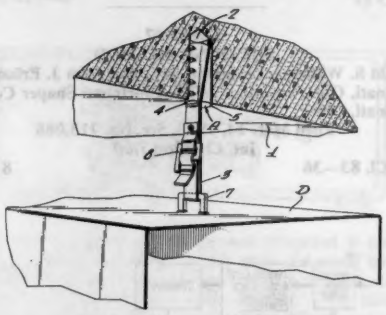
A stop for a cello end pin. It comprises a baseplate provided at its outer end with an abutment to receive and be engaged by the end pin of a cello or base violin or any other instrument, and at its inner end it has cord engaging means, and a cord of adjustable length with its free ends extending from the baseplate to the leg or legs of a chair on which the player sits.

3,598,012
ADJUSTABLE CAPOTASTO
James Dunlop, 625 37th st., Richmond, Calif.
Filed June 29, 1970, Ser. No. 50,696
Int. Cl. G10d *3/00*
U.S. Cl. 84—318 **8 Claims**



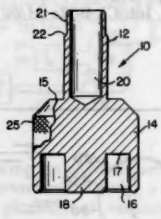
A capotasto for stringed instruments consisting of a pressure member and means for attaching the pressure member to the neck of an instrument in a manner that exerts dependably the proper amount of pressure upon its strings, comprising a band, a self-locking slide buckle engaged over one end of said band to precisely adjust its effective length and having means for pivotally attaching it to one end of the pressure member, and tensioning means preferably in the form of a toggle lever interposed between the opposite end of said band and the pressure member, to tension the band after its effective length has been adjusted. Thus, upon actuation of the toggle lever, precisely the proper amount of pressure will be exerted by the pressure member of the capotasto upon the strings of the instrument irrespective of what the size or conformation of its neck may be.

3,598,013
ANCHORING DEVICE
Georg Broberg, Solna, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden
Continuation-in-part of application Ser. No. 856,600, Sept. 10, 1969. This application Mar. 13, 1970, Ser. No. 19,272
Int. Cl. E21f *17/02*; F16b *2/00*
U.S. Cl. 85—79 **6 Claims**



An anchoring device is disclosed for mounting in a vertical hole in a horizontally disposed building member to secure a tension member from which a length of ventilation duct is suspended. The device comprises complementary wedge-shaped elements dimensioned to be received axially in the hole, one element being fixedly mounted with its base disposed adjacent the top of the hole and the other element being movably mounted with its base disposed near the bottom of the hole. The fixed element has a series of downwardly facing transverse teeth in its outer surface engaging the side of the hole and the movable element has a smooth outer surface engaging the side of the hole, each element having smooth parallel confronting surfaces inclined with respect to the axis of the hole for frictionally engaging a portion of the tension member when the movable element is driven upwardly with respect to the fixed element. In one embodiment, the elements are solid and the tension member is a thin, flat strip or wire. In another embodiment, the elements have U-shaped transverse cross sections with parallel legs, the confronting surfaces being formed on the legs and the tension member being a thin, flat strip frictionally engaged between the legs.

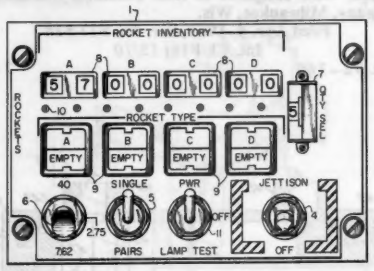
3,598,014
METHOD AND TOOL FOR REFILLING SPENT SHELLS WITH SHOT
John F. Vadas, Webster, N.Y., assignor to Crosman Arms Company, Inc., Fairport, N.Y.
Filed Apr. 30, 1969, Ser. No. 820,444
Int. Cl. F42b *33/02, 33/12*
U.S. Cl. 86—28 **4 Claims**



The refilling tool has a tubular stem at one end, and in its opposite end has an annular recess which surrounds a cylindrical boss that is disposed coaxially of the stem. The stem will hold just enough shot to fill one shell. After the stem is loaded with shot, a plastic wad is positioned over the outer end of the stem, and an empty shell is pressed over the stem to force the wad into the shell to a predetermined depth. The assembly is then inverted and the tool is withdrawn. A

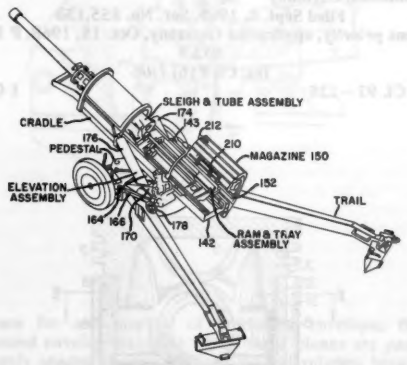
second wad is then placed in the now-upper end of the shell above the shot; and the boss on the tool is placed against this second wad to force it into the shell so that the shot is secured in the shell between the two wads.

3,598,015
MIXED POD ROCKET RELEASE SYSTEM
John Delistovich, Jersey City; Edward J. Golden, Hamburg; Roger J. Talish, Fairfield, and Kenneth J. Urgovitch, Clifton, all of, N.J., assignors to The Bendix Corporation
Filed Apr. 2, 1969, Ser. No. 812,735
Int. Cl. F41f *5/02*
U.S. Cl. 89—1.814 **6 Claims**



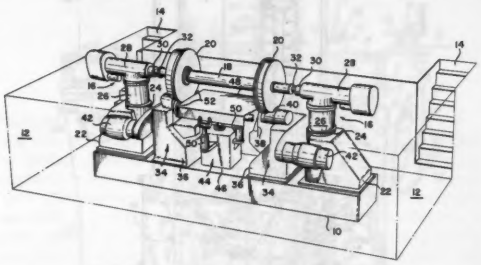
A rocket release system, for an aircraft, having rocket pods randomly loaded with mixed rocket types and having provisions for selecting the type, release mode and quantity of rockets to be released. The rocket release is programmed so that the weapons remain balanced on each side of the aircraft and only safe combinations of rockets may be released. A continuous display of rocket inventory is provided along with a warning when the inventory of a particular type of rocket is depleted.

3,598,016
AUTOMATIC BURST FIRING GUN HAVING REVOLVING CHAMBERS
Robert Ernest Chiabrandy; John Leonard Amidon, and James Dexter Scanlon, all of Burlington, Vt., assignors to General Electric Company
Filed Mar. 18, 1969, Ser. No. 808,155
Int. Cl. F41d *7/04*
U.S. Cl. 89—157 **11 Claims**



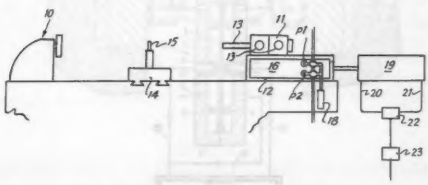
An automatic, burst-firing howitzer is provided having a single tube or gun barrel, and two alternatively and sequentially utilized firing chambers which reciprocate with the tube in recoil and counterrecoil. A loading system is provided to load rounds of ammunition sequentially into the next respective firing chamber during recoil, and to extract the previously fired case from the preceding firing chamber during counterrecoil. The loading system includes a floating, double-ended, spring- and gas-loaded, hydraulic piston system for continuously monitoring the recoil velocity of the recoiling mass and for traversing the round at the appropriate velocity and for the appropriate distance to fully chamber the round by the end of the recoil travel. Depending on the recoil travel the gun can fire out of battery, or in battery.

3,598,017
WHEEL TRUING MACHINE
Oliver E. Saari, Niles, Ill., assignor to Stanray Corporation, Chicago, Ill.
Filed Mar. 10, 1969, Ser. No. 805,523
Int. Cl. B23c *1/14;* **B24b** *5/46*
U.S. Cl. 90—20 **8 Claims**



Apparatus for truing the wheels of a railway vehicle wheel- and -axle assembly. The vehicle axle is maintained in a fixed alignment by means of retractable centers, and the truing tool rotates about an axis which is maintained parallel to the vehicle axle. Drive rollers are provided to support and drive the vehicle wheels. The drive rollers are carried by a platform mounted for limited universal movement on a hydraulic lift mechanism which supports the weight on the vehicle wheels. Resilient means are provided to damp the universal motion of the platform. The truing tool is a milling cutter having a body contoured to the shape of the vehicle wheel, with cylindrical cutting buttons affixed to the body in diagonal ranks to form a helical pattern. The buttons in the wheel flange cutting portion of the cutter body are disposed with their longitudinal axes substantially normal to a radius of the cutter body, while the buttons in the tread cutting portion are disposed with their longitudinal axes substantially coincident with a radius of the cutter body. The flange cutting buttons may be arranged in ranks which are offset from the ranks containing the tread cutting buttons, and next adjacent buttons in the helical pattern may be spaced by staggering the ranks.

3,598,018
CONTROL MEANS FOR A MACHINE TOOL
John M. J. Varga, Lytton Cottage, Toothhill Lane, Brighouse, Yorkshire, England
Continuation-in-part of application Ser. No. 657,649, Aug. 1, 1967. This application May 21, 1969, Ser. No. 826,635
Int. Cl. F15b *21/02*
U.S. Cl. 91—37 **13 Claims**



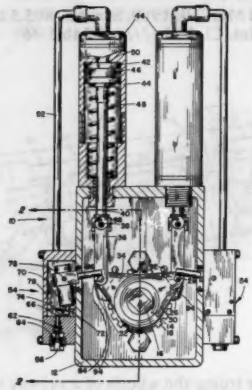
Control means for a machine tool having a member which needs to be moved in accordance with a predetermined program, said control means comprising a magnetizable surface adapted to be prerecorded with a pair of magnetic wavelength modulated waveform tracks, and a pair of pickup heads adapted to detect the waveforms and thus cause the member to be moved at speed which are dependent upon the ratio of the frequencies detected by the pickup heads.

3,598,019

PRESSURE FLUID ACTUATOR

Henry R. Killian, Greensburg, Pa., assignor to Walworth Company, New York, N.Y.

Filed Aug. 19, 1969, Ser. No. 851,379
Int. Cl. F01l 31/02; F15b 13/042
U.S. Cl. 91—347 7 Claims



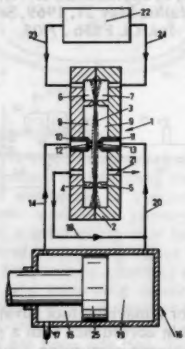
An intermittent drive mechanism comprising a piston which is selectively driven to reciprocate a link carrying a pawl to turn a ratchet wheel through an angular increment. Pressure fluid, when introduced to the piston inlet line, forces a check valve to seal against an exhaust port and close the fluid system to start the piston stroke. At the end of the stroke, a switch is tripped to back the check valve from the exhaust port and against the inlet port to seal it off. With pressure off, a spring returns the piston and then the switch is again tripped to release the check valve for another cycle.

3,598,020

MAIN CONTROL SYSTEM FOR HYDRAULIC SERVOMOTORS

Petrus Blok, Coymansstraat 7, Moerkapelle, and Taco J. Viersma, Julianalaan 26, Pijnacker, both of, Netherlands

Filed May 19, 1969, Ser. No. 825,869
Claims priority, application Netherlands, May 31, 1968, 6807776
Int. Cl. F15b 15/11, 9/10; F01b 15/00
U.S. Cl. 91—416 6 Claims



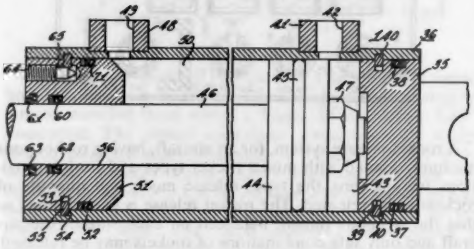
A control system for a hydraulic servomotor, comprising a cylinder chamber containing a diaphragm which is borne, between two circular bearing edges so that a central and an annular compartment are produced on either side of the diaphragm, each of the annular compartments being connected to a pilot system, the first central compartment being connected to a cylinder of a servomotor, and the second to a discharge, in each central compartment an outflow member discharging towards the center of the diaphragm the member in the first compartment connected to a high-pressure supply and the other member to said cylinder.

3,598,021

HYDRAULIC CYLINDER ASSEMBLY

Herbert Z. Langland, Topeka, Kans., and John R. Plate, Milwaukee, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Apr. 4, 1969, Ser. No. 813,528
Int. Cl. F16j 13/10
U.S. Cl. 92—169 7 Claims



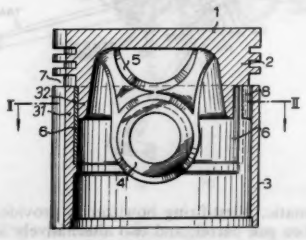
A hydraulic cylinder comprising an assembly of easily manufactured and conveniently assembled components.

3,598,022

LIGHT METAL PISTON HAVING HEAT EXPANSION CONTROL INSERTS

Rudolf Maier, Deidesheimer Str. 27, 7 Stuttgart-Weil im Dorf, Germany, MAHLE Komm.—Ges., Stuttgart-Bad Cannstatt, Germany

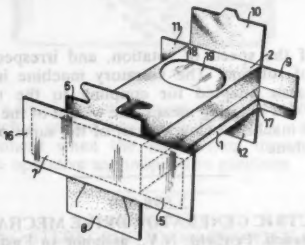
Filed Sept. 4, 1969, Ser. No. 855,138
Claims priority, application Germany, Oct. 18, 1968, P 18 03 832.9
Int. Cl. F16j 1/06
U.S. Cl. 92—228 1 Claim



The skirt of a light metal piston is divided into a short inner portion and a long outer portion between which heat expansion controlling inserts are embedded. The inner and

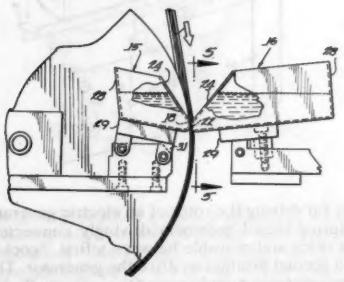
outer skirt portions are separated from each other to form cavities midway between the wristpin bosses and the ends of the inserts are spaced by the cavities. The cavities and inserts extend up to the lowermost piston ring groove.

3,598,023
METHOD OF MAKING A TIGHT PACKAGE PROVIDED WITH WINDOWS
Toivo Artturi Hakala, Kauttua, assignor to AB Akerlund & Rausing, Lund, Sweden
Filed May 8, 1969, Ser. No. 822,923
Claims priority, application Sweden, May 8, 1968, 6197/68
Int. Cl. B31b *7/00*
U.S. Cl. 93—36.01 3 Claims



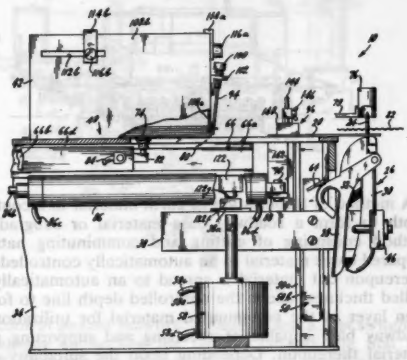
A method for making a carton which is lined with an impervious transparent material and is provided with a window over which the transparent material is disposed to permit viewing of contents.

3,598,024
ENVELOPE MANUFACTURE
Ernst C. Sauerman, Chicago, Ill., assignor to Gaw-O'Hara Envelope Co., Chicago, Ill.
Filed June 20, 1969, Ser. No. 835,014
Int. Cl. B31b *21/26*
U.S. Cl. 93—62 2 Claims



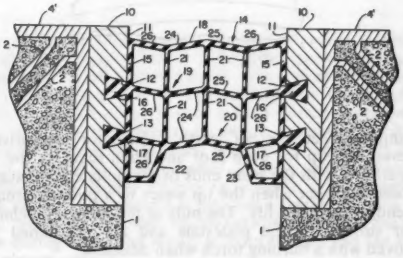
Means for and method of producing envelopes from preformed envelop blanks in which these blanks are passed in closely spaced overlapping or shingled relation between closely spaced and opposed gum boxes which simultaneously apply ribbons of latex or adhesive to an exposed area at an end of the inner and outer surfaces of the envelop blanks forming at one end a sealing flap and at the other end an auxiliary sealing flap which, when folded with the latex on these flaps aligned and engaged in pressure contact, seals the envelope. These blanks after passing between the opposed gum boxes for simultaneous applications of the ribbons of latex, are then fed between heating chambers or zones for drying, and, subsequently scored and folded to provide an upper sealing flap and a reversely folded auxiliary sealing flap.

3,598,025
TAGGING MACHINE
Abe Cotton, Jamaica, N.Y., assignor to Fairfield-Noble Corporation, Farmingdale, N.Y.
Filed May 5, 1969, Ser. No. 821,815
Int. Cl. B31f *7/00*
U.S. Cl. 93—87 7 Claims



Hang-tags are frequently attached to cloth garments by means of a hand-operated bar-lock-dispensing assembly which deposits a bar-lock attachment intermediate the cloth and the tag. Apparatus automating this process comprises a traditional bar-lock-dispensing assembly supported for movement through a reciprocal power stroke and a reciprocating tag feed assembly including a tag storage bin. The bar-lock dispenser and the tag feed assembly are powered by a combined power and timing system which positions a tag beneath the dispensing assembly prior to the insertion of a bar-lock.

3,598,026
JOINT-SEALING APPARATUS
Harry W. Johnson, Chicago, Ill., assignor to W. R. Grace & Co., Cambridge, Mass.
Filed Jan. 31, 1969, Ser. No. 795,630
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 14 Claims



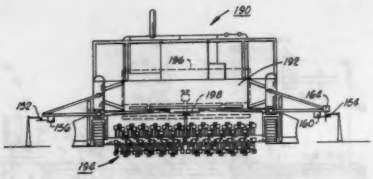
A joint-sealing device for use primarily in road or bridge deck joints in which an anchor is fixed to each side of the joint, each anchor presenting confronting abutments inside the joint and a compressible, resilient, elastic sealing member seated between the abutments for a watertight seal. Each abutment has a cavity extending the length of the joint and the joint-sealing member has a mating projection extending into the cavity to retain the joint-sealing member in its proper position. In addition, a method of installing such an apparatus is described.

3,598,027

METHOD OF ROAD CONSTRUCTION

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Feb. 5, 1969, Ser. No. 796,853
Int. Cl. E01c *21/00*
U.S. Cl. 94—22 13 Claims



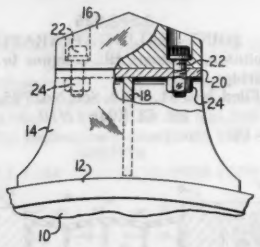
A method of stabilization of earth material to a controlled depth to form a roadway base material or subgrade, the method consisting of cutting and comminuting native or prepared earth material to an automatically controlled depth whereupon cut material is spread to an automatically controlled thickness above the controlled depth line to form an even layer of the comminuted material for utilization as a roadway base capable of receiving and supporting paving material thereupon. Depending upon the suitability of the earth material for base purposes, additional steps may be taken to add specified liquid or dry materials to the comminuted earth material to adjust the plasticity index to a proper value for utilization as a paving material support substance.

3,598,028

EARTH COMPACTOR FEET

Gerald E. Grant, Oswego; Charles R. Jefferson, Pekin; Victor Randour, Aurora, and Austin G. Skromme, Jr., Peoria, all of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 5, 1969, Ser. No. 830,793
Int. Cl. E01c *19/24*
U.S. Cl. 94—50 3 Claims



Tamping feet for an earth compactor comprising a pedestal and tip for each foot and bolts securing the tip to the pedestal with the head ends of the bolts countersunk but exposed for wear when the tip wears to a point approaching the end of its useful life. The nuts of the bolts are behind the outer surface of the pedestals and are positioned to be removed with a burning torch when desirable.

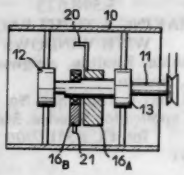
3,598,029

VIBRATORY MACHINE, ESPECIALLY INTENDED FOR COMPACTING GROUND

Michel Paramythioti, Chantilly, France, assignor to Albaret S. A., Rantigny, France

Filed Aug. 1, 1969, Ser. No. 846,667
Claims priority, application France, Aug. 12, 1968, 162,659
Int. Cl. E01c *19/28*
U.S. Cl. 94—50 8 Claims

A vibratory machine, especially intended for compacting ground, comprising a vibrating body subjected to the action of a rotating vibrator shaft carrying two eccentric flyweights, one of which is fixed for rotation on said vibrator shaft while the other is free for rotation thereon, the effects of said flyweights over a determined range of frequencies have a geometric resultant which varies in a continuous manner as a function of the speed of rotation, and irrespective of the direction of rotation. The vibratory machine is associated with a chassis adapted for coupling to the machine by suspension and isolating means, the weight of the chassis carried by the machine being at least of the same order as that of said machine.

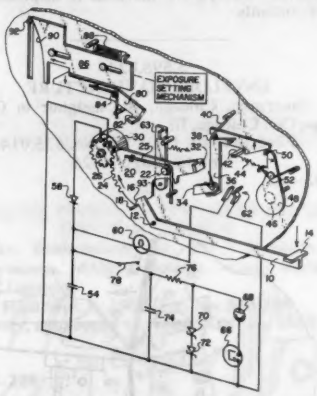


3,598,030

ELECTRIC GENERATOR DRIVE MECHANISM

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,942
Int. Cl. G03b *7/12, 15/03*
U.S. Cl. 95—10 C 4 Claims



Devices for driving the rotor of an electric generator which include spring-biased members drivingly connected to the generator rotor and movable between a first, "cocked" position and a second position to drive the generator. The output of the generator may supply power to a camera flashlamp circuit or an exposure control mechanism. A reset mechanism is provided to return the generator-driving member to its first, "cocked" position against the spring bias. After being set in motion, the generator rotor may continue to move independent of the driving member.

3,598,031

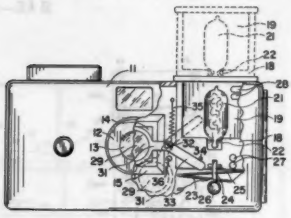
PHOTOGRAPHIC CAMERA WITH MEANS FOR VARYING A FOCUS ADJUSTMENT TO PHOTOGRAPH AN ARTIFICALLY ILLUMINATED SUBJECT

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1967, Ser. No. 614,086
Int. Cl. G03b *17/12*
U.S. Cl. 95—11 15 Claims

A camera having an optical lens system for automatically changing the focal distance of the objective lens in response

to movement of an artificial illuminating device between an operative and an inoperative position on the camera. The illuminating device may be a built-in flash unit, a flashbulb, or a detachably mounted flash unit. The optical lens system



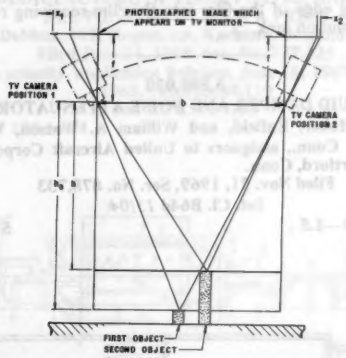
consists of a fixed lens component and a movable lens component which is moved into or out of registry with the fixed lens component when the illuminating device is moved between the operative and inoperative positions.

3,598,032

PRODUCING STEREOPHOTOGRAPHS WITH A CLOSED CIRCUIT TELEVISION SYSTEM

Stanley W. Bohn, Bethel Park, and William J. Dimond, Allison Park, both of, Pa.

Filed Nov. 14, 1969, Ser. No. 876,933
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 P **2 Claims**



A method of producing a three-dimensional stereo effect. A television camera is moved in an arc about the objects to be photographed. The images appearing on a television monitor are photographed at each of two camera positions. Stereophotographs are produced from the monitor images by use of an offset contact-printing technique. The two resultant stereophotographs are examined simultaneously through a stereoviewer.

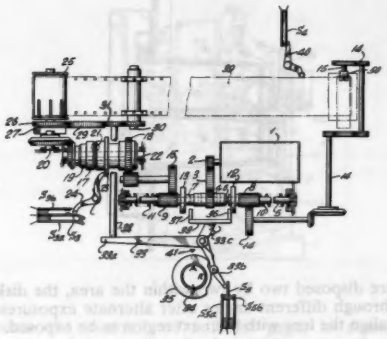
3,598,033

CAMERA FILM AUTOMATIC WIND AND REWIND MECHANISM

Tetsuo Sasaki, Iruma-gun, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 1, 1968, Ser. No. 772,613
Claims priority, application Japan, Nov. 20, 1967, 42/74559
Int. Cl. G03b *1/12, 19/04*
U.S. Cl. 95—31 EL **8 Claims**

A camera automatic wind and rewind mechanism which includes an electric motor coupled through a first clutch to the rewind spindle and through a second clutch and a torque limiting clutch to the film takeup spool. The device includes a mechanism which releasably and alternatively couples the takeup spool and the rewind member to the electric motor and consists of a film advance control first network, a film rewind control second network, a battery, and a first switch for alternatively connecting the battery through the first and second networks simultaneously with the coupling of the takeup spool and rewind member to the motor.

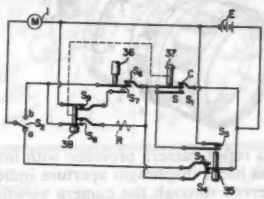


3,598,034

ELECTRIC MOTOR DRIVEN AUTOMATIC FILM ADVANCE

Minoru Suzuki, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 2, 1968, Ser. No. 780,501
Claims priority, application Japan, Dec. 2, 1967, 42/77,093
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 EL **11 Claims**



An automatic film advance includes a motor connected through a coupling which is disengaged upon a frame advance and actuates a double-throw switch from an automatic motor-energizing circuit to a manual shutter release switch circuit. Actuation of the shutter release switch energizes the motor to release the shutter and switch to automatic circuit, the shutter release opening the energizing circuit and shunt braking the motor during shutter opening and reverses the condition upon shutter closing to advance a film frame. A switch network permits rapid sequence frame advance and shutter operation. Another switch network permits a bulb exposure during which the motor is shunt braked and the energizing circuit opened.

3,598,035

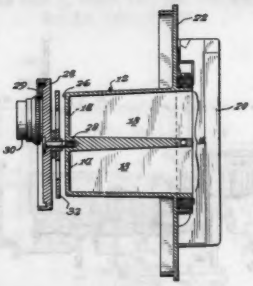
LENS ASSEMBLY

Jacob S. Haller; Hans Kist, and Andor Fleischman, all of Northbrook, Ill., assignors to Indentification Development Corporation

Filed Apr. 8, 1968, Ser. No. 719,586
Int. Cl. G03b *19/02*
U.S. Cl. 95—38 **9 Claims**

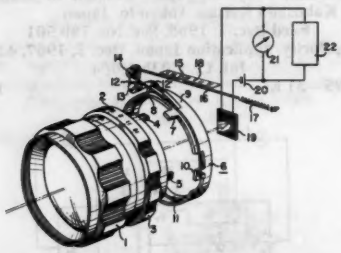
A lens assembly for exposing a plurality of different regions within a fixed area through a single lens mounted on a rotatable lens turret. Upon initiation of a cycle of operation, a region corresponding to the position of the lens is exposed

and the turret is automatically rotated to index the lens into position for exposure of another region. In a configuration where the area is rectangular in shape and four rectangular



regions are disposed two by two within the area, the disk is rotated through different angles after alternate exposures to properly align the lens with the next region to be exposed.

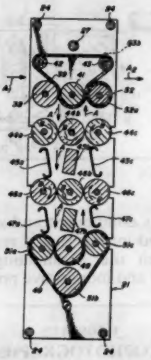
3,598,036
DIAPHRAGM VALVE INDICATOR
Minoru Suzuki, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed May 28, 1969, Ser. No. 828,524
Claims priority, application Japan, June 12, 1968, 43/40350
Int. Cl. G03b *17/20*
U.S. Cl. 95—64 R **1 Claim**



A single lens reflex camera provided with interchangeable objective lenses has a diaphragm aperture indicator element and scale observed through the camera viewfinder. The indicator element is coupled to the diaphragm ring by a motion transmission wherein the rate of movement of the indicator element relative to that of the diaphragm adjustment varies in the vicinity of the fully open diaphragm to compensate for the vignetting effect. The transmission includes a string engaging the indicator and releasably connected to the diaphragm ring, and engaged by a guide mounted on a lever which is rocked by a cam in the area of the diaphragm open position.

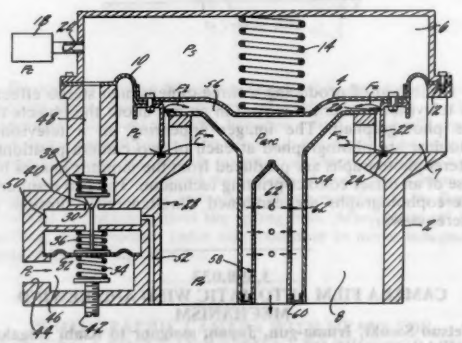
3,598,037
FILM-DEVELOPING APPARATUS
Herbert W. Houston, Sr., 655 East 20 St., Yuma, Ariz.
Filed Feb. 6, 1970, Ser. No. 9,345
Int. Cl. G03d *3/12*
U.S. Cl. 95—89 R **3 Claims**

An improved continuous film-developing apparatus particularly adapted for developing sheet or cut films. The necessity for washing the film free of chemicals between each processing stage is obviated and film is automatically threaded through the apparatus by means of a film-drive assembly carried in the upper portion of each chemical tank. The film-drive assembly includes three spaced horizontal rollers, the axes of rotation of which are arranged in a triangular pattern, and a film-drive web around the triangularly spaced rollers. A film-receiving roller and film-ejecting roller are spaced on either side of the apex of the triangle and bear inwardly against the film-drive web. Film inserted between the film-receiving roller and the web is transported partially around the film-receiving roller and downwardly into the chemical tank. Rollers in the lower portion of the tank return the film upwardly to the ejecting roller. Film passing between the ejecting roller and the web is wiped free of the chemical,



is transported partially around the ejecting roller and is ejected outwardly from the apparatus to the film-receiving roller of the next chemical tank. The angle at which the film is ejected is adjustable, providing for automatic feeding of the leading edge of the film into the film-receiving roller in the next solution tank.

3,598,038
FLUID DAMPER AND NOISE ATTENUATOR
John F. Maher, Enfield, and William A. Watson, Vernon, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 21, 1969, Ser. No. 878,733
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **5 Claims**



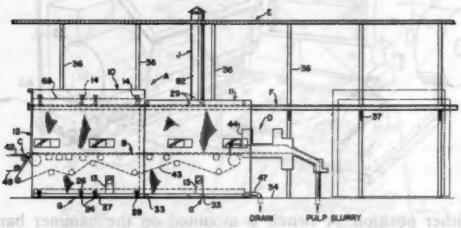
A fluid valve in which flutter of the pressure-responsive member is eliminated is provided with a tube with holes in the wall thereof in the outlet area of the valve to reduce pressure fluctuations on the undersurface of the pressure-responsive member.

3,598,039

MOVABLE PAPER MACHINE HOOD

James L. Bryant, Dorval, Robert Baldwin County, Quebec, Canada, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 4, 1968, Ser. No. 765,105
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 R 6 Claims



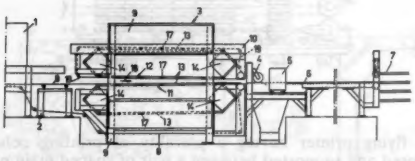
The fourdrinier section of a papermaking apparatus is isolated from the remainder by a completely removable encompassing hood cover or housing, having disengaging vent means, isolating the moisture-generating initial period. The hood is of one or several sections where each is movable, one telescoping into another, and the single or telescoped unit adapted to be powered for movement in a desired direction to provide full access to the uncovered section.

3,598,040

CONTINUOUS-WORKING PRESS, PARTICULARLY FOR THE MANUFACTURE OF FIBER PLATES, AND PLANT PROVIDED WITH SUCH A PRESS

Albert DeMets, 105, Hogestraat, Kachtem, Belgium

Filed June 14, 1968, Ser. No. 737,125
Claims priority, application Belgium, June 16, 1967, May 31, 1968, 700,055;59,119
Int. Cl. B30b *5/06*
U.S. Cl. 100—154 6 Claims



A press having relatively movable frames and rollers is provided for manufacturing fiber plates and the like. The movable upper frame is connected to the bearings supporting the first and last upper rollers and provides relative adjustment of pressure and belt tension. Hydraulic cylinders and pistons suspend the movable frame from the stationary frame of the press.

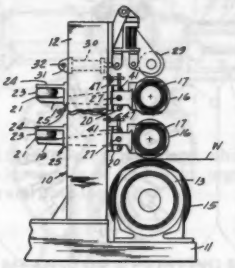
3,598,041

OFFSET CALENDER ROLLS

Donald B. De Noyer, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed July 25, 1969, Ser. No. 844,962
Int. Cl. B30b *3/00*
U.S. Cl. 100—163 10 Claims

Stabilizing mounting for calender rolls, compensating for horizontal deflection of the rolls by offsetting the roll axes horizontally. Stabilizing of the rolls is attained by mounting the lift arms of the rolls on vertically extending swing arms on individual pivots extending transversely of the lift arms. Each swing arm is pivoted to a pivot bracket for the roll at one end, pivotally supports the lift arm intermediate its ends, and is adjustably connected to the pivot bracket at its opposite end by an eccentric pin, movable in an open slot in the swing arm to offset the roll axis as required and to accommodate the insertion of a feeler gage, to determine the direction of the resultant horizontal forces, as the eccentric pin is adjustably moved.

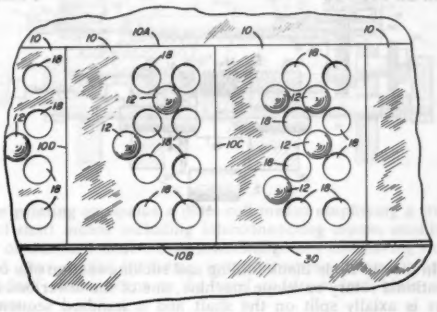


3,598,042

BRAILLE PRINTING SYSTEM

Harry S. Boyd, 6409 South Knoxville, Tulsa, Okla.

Filed Mar. 17, 1969, Ser. No. 807,672
Int. Cl. B44b *5/00*
U.S. Cl. 101—3 1 Claim



This invention relates to an element for embossing a braille character into paper. More particularly, the invention relates to a means of printing braille characters into both sides of paper at the same time. Each of the embossing elements includes one or more indentations therein arranged in rows and columns according to an established braille system and spaced apertures aligned in rows and columns, there being a total number of apertures equal to the products of the number of rows times the number of columns, the rows and columns of the apertures being displaced from the rows and columns of indentations and adaptable to receive therein the indentations of opposed embossing elements as the elements are utilized in a printing press.

3,598,043

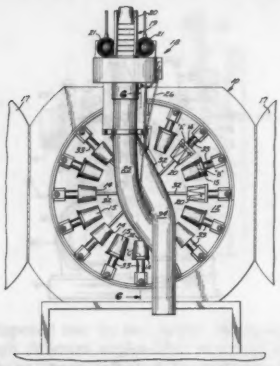
PRINTING MACHINE FOR CONICAL CUPS

Richard William Schuff, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed June 20, 1969, Ser. No. 835,001
Int. Cl. B41f *17/28*
U.S. Cl. 101—40 4 Claims

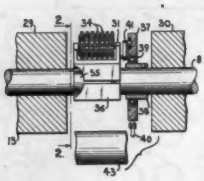
A printing machine for conical cups including a turret and individual cup-holding means mounted on the turret. The cup-holding means are rotated with the turret in a single plane to permit high speed printing. Alternate ink applicator

rollers are spaced between the cup-holding means. To prevent sliding of the cup surface on the printing plate, the



cup-holding means are positioned such that they will rotate the cup surface over the printing surface.

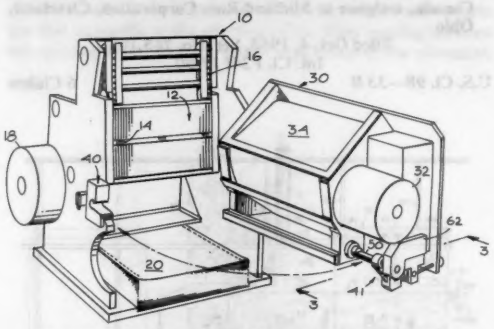
3,598,044
CONSECUTIVE NUMBER PRINTING IN THE FOLDING SECTION OF A ROTARY ENVELOPE MACHINE
Joseph M. Hutchinson, Fort Worth, Tex., assignor to Tension Envelope Corporation, Kansas City, Mo.
Filed Sept. 22, 1969, Ser. No. 859,836
Int. Cl. B41l *49/02*
U.S. Cl. 101—76 **4 Claims**



In the envelope blank folding and sticking section of a conventional rotary envelope machine, one of the lower bed rollers is axially split on the shaft and a standard sequential number-printing head mounted between the split sections for rotation on the shaft into the paper plane. The printing head cooperates with the upper cylinder normally engaging the bed roller for printing consecutive numbers on the blanks as they pass through the section in the usual manner. The shaft carrying the printing head is reduced in effective diameter at the head-mounting position to permit the correct radial distance from the shaft axis to the plane of the blanks, otherwise not obtainable with a standard printing head.

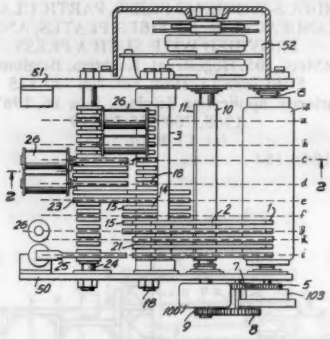
3,598,045
ASSEMBLY FOR LATCHING A HINGED PRINTING DRUM INTO ALIGNMENT WITH A HAMMER BANK
Richard H. Miller, Chatsworth, Calif., assignor to Data Products Corporation, Culver City, Calif.
Filed Feb. 7, 1969, Ser. No. 797,446
Int. Cl. B41j *9/00*; **E05c** *3/04*
U.S. Cl. 101—93 R **5 Claims**

A latch assembly useful in a high speed printing apparatus for latching a hinged drum gate into alignment opposite to a hammer bank. The latch assembly is comprised of a bracket fixedly mounted on the hammer bank frame. The bracket defines a slightly inclined entrance ramp leading to a substantially semicylindrical vertically oriented shaft receptacle. A substantially semicylindrical shaft is mounted for rotation on the drum gate. A lever is provided for rotating the shaft between a horizontally oriented position and a vertically oriented position in which the shaft can be nested in the receptacle. Detent means are provided to retain the shaft in



either position. A switch is mounted on the hammer bank frame for sensing the shaft orientation and position.

3,598,046
PRINT HAMMER INTERPOSER AND ACTUATING MEANS IN FLYING PRINTERS
Shigeyoshi Hirabayashi, Nagano-ken, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed May 12, 1969, Ser. No. 823,892
Claims priority, application Japan, May 13, 1968, 43/31816
Int. Cl. B41j *9/36*
U.S. Cl. 101—93 **3 Claims**

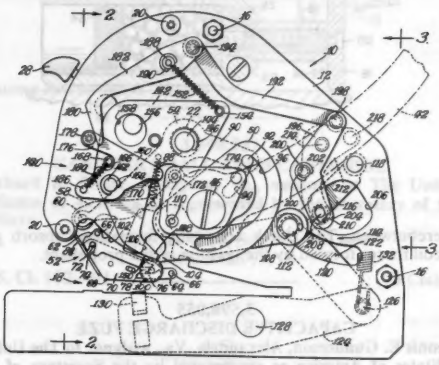


A flying printer having a plurality of printing columns disposed and supported between a pair of spaced main plates and having printer-driving means, timing and synchronization means and paper-feeding means disposed outside of said main plates and mounted thereon. The flying printer preferably includes a continuously rotating ratchet wheel having at least one tooth extending therefrom and a print drum rotated in synchronization with said ratchet wheel, both mounted between said main plates. Each printing column includes a trigger lever adapted for rotational and linear displacement, a print hammer adapted to effect printing in response to the linear displacement of said trigger lever and means including an electromagnet for selectively rotating said trigger lever into and out of the path of said ratchet wheel tooth, said trigger lever being linearly displaced when disposed in said path.

3,598,047
CHECKWRITER-INKING CONTROL MEANS
Ardath A. Gopperton, Mount Prospect, Ill., assignor to Theodore B. Hirschberg, Jr., Chicago, Ill.
Filed Aug. 28, 1969, Ser. No. 853,715
Int. Cl. B41j *03/00*, *05/00*
U.S. Cl. 101—95 **10 Claims**

A machine for printing money orders and like instruments including a frame, means defining a printing line, individually

adjustable type segment members supported by the frame and having numerical printing characters thereon ranging from zero to numbers greater than zero positionable on the printing line, an inking roller supported for movement into contact with printing characters disposed on the printing line, a platen underlying the printing line and movable to engage an instrument disposed between the platen and printing



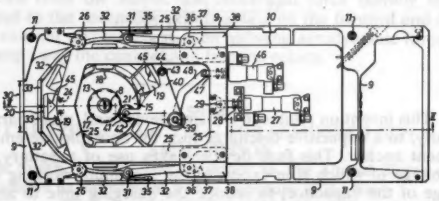
characters on the printing line, an operating handle movable from a nonprinting to a printing position for effecting operative movement of the inking roller and platen, and control lever means for preventing movement of the inking roller into contact with the printing characters on the printing line unless at least one of the type segment members is positioned such that a printing character thereon greater than zero is disposed on the printing line.

3,598,048

PRINT WHEEL SETTING AND ACTUATING MEANS

Per-Olov Hellstrom, Malmo, Sweden, assignor to AB Turnkey-Projekt, Malmo, Sweden

Filed Nov. 14, 1968, Ser. No. 775,830
Int. Cl. B41j *1/60*
U.S. Cl. 101—106 **3 Claims**



In a stamping apparatus having a frame and at least one printing type which is mounted on a support and is pressed against a print receiving surface after contact with an inking-pad device, the printing type is rectilinearly mounted on the support which is mounted on the frame in a fixed position thereon, and a slide on the frame engages the printing type by means of a cam on the slide for moving the printing type towards and away from the print receiving surface.

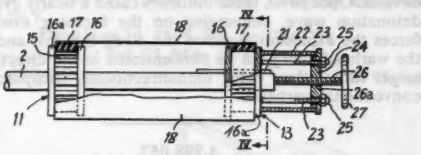
3,598,049

ENDLESS BAND STENCILING APPARATUS

Madiane Gilbert De Souza Dias, Alfortville, France, assignor to Societe Vitos Etablissements Vitoux, Troyes, France

Filed Feb. 10, 1969, Ser. No. 797,998
Claims priority, application France, Feb. 8, 1968, 139064
Int. Cl. B41l *13/08*
U.S. Cl. 101—122 **12 Claims**

A stenciling apparatus is provided with a screen formed as an endless band trained about and tensioned on four sprockets and driven by a shaft on which two of said sprockets are mounted. The sprockets are adjustable to vary the longitudinal and transversal tension of the screen. The objects to be printed on are brought into contact with the



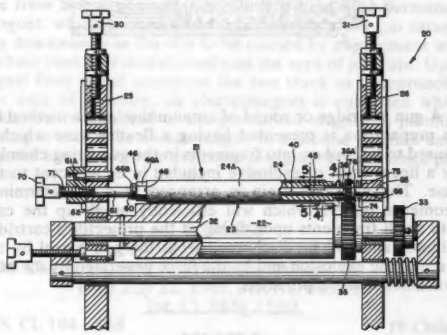
outer face of one flight of the screen band, while a scraper, in contact with the inner face of said flight, urges printing ink across the screen and onto the object.

3,598,050

MOUNTING MEANS FOR A PRINTING ROLL AND ASSOCIATED DRIVING APPARATUS

John R. Thompson, Cincinnati, Ohio, assignor to International Machine Products, Inc., Cincinnati, Ohio

Filed July 18, 1968, Ser. No. 745,823
Int. Cl. B41f *13/10, 5/00*
U.S. Cl. 101—216 **7 Claims**



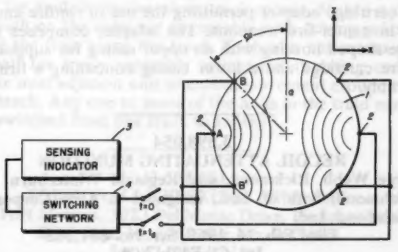
In printing apparatus a plate roll means employing a standard shaft means including interconnecting means enabling use of standard shaft means interchangeably and having standard gear means including interconnecting means to said standard shaft means to be used to drive said plate roll means.

3,598,051

DIRECTIONAL WARHEAD

William H. Avery, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 25, 1968, Ser. No. 747,603
Int. Cl. F42d *1/06*
U.S. Cl. 102—23 **9 Claims**



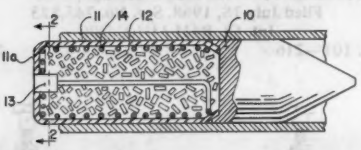
The present invention comprises a spherical explosive device that, by selective multipoint initiation, concentrates its

energy in a beam along any of several aiming axes. Aiming is accomplished by electronically selecting the proper group of detonators, thereby eliminating the necessity of physically aiming the charge as is required in all other focused blast devices. Once fired, these initiators cause a nearly cylindrical detonation wave, converging on the focusing axis, which forces the explosion products out along this axis and causes the warhead energy to be concentrated in the direction of a target rather than being omnidirectionally dissipated as in conventional warheads.

3,598,052
CARTRIDGE WITH FRAGMENTABLE CASE

Jules J. Schwartz, Wilmington; Robert E. Black, Jr., Newark; Harry G. Jones, Newark, Del., and Kenneth D. Rubin, Dover, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Sept. 23, 1969, Ser. No. 860,318
Int. Cl. F42b *5/30*
U.S. Cl. 102—38 **15 Claims**

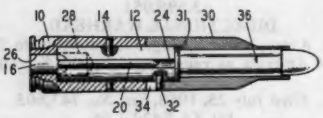


A gun cartridge or round of ammunition and a method for its preparation is presented having a flexible case which is caused to be broken into fragments in the gun firing chamber by a linear train of explosive included in or adjacent to the case. The explosive train is arranged in a predetermined geometric pattern which will efficiently break up the case into small fragments upon firing of the projectile's cartridge initiator and will be discharged from the gun barrel by the force of the explosion and by the force generated by the bore evacuator if one is provided.

3,598,053
CARTRIDGE ADAPTER

Irving W. Glater, 277 North Quaker Lane, West Hartford, Conn.

Filed Nov. 12, 1969, Ser. No. 875,986
Int. Cl. F42b *5/22, 9/20, 13/20*
U.S. Cl. 102—41 **10 Claims**



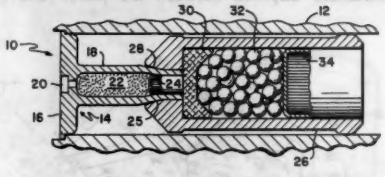
A cartridge adapter permitting the use of rimfire ammunition in center-fire weapons. The adapter comprises a cartridge-shaped housing with an upper casing for supporting a rimfire cartridge and a lower casing containing a firing pin assembly.

3,598,054
RECOIL ATTENUATING MUNITION

George Webb, Richmond, and Reginald Winterburn, South Richmond, both of, Ind., assignors to Avco Corporation, Richmond, Ind.

Filed Feb. 24, 1969, Ser. No. 801,365
Int. Cl. F42b *7/06*
U.S. Cl. 102—42 C **11 Claims**

A unique munition is disclosed which will isolate the forces of the propellant system from the gun. Slidable coaxial castings are formed to provide shock absorbing formations

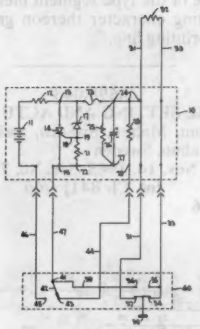


therebetween. The shock absorbing formations absorb gun recoil forces formed by the ignition of the propellant.

3,598,055
CAPACITIVE DISCHARGE FUZE

Dennis E. Gunderson, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 31, 1968, Ser. No. 772,330
Int. Cl. F42c *15/40*
U.S. Cl. 102—70.2 **1 Claim**



This invention relates to a fuzing device and, more particularly, to a capacitive discharge fuze for an explosive embedment anchor. This fuze device makes use of a battery, the voltage of which is in excess of the maximum working voltage of the capacitor, to reduce the charging time to an acceptable minimum. A first switch connects the battery to the capacitor. A Zener diode acting in conjunction with a silicon controlled rectifier and a replaceable fuse element control the charging of the capacitor. At the rated voltage of the capacitor, the Zener diode triggers the silicon controlled rectifier causing a short circuit through the fuse element across the capacitor. The excessive current through the short circuit path melts and permanently opens the fuse element thereby permanently isolating the charged capacitor from the charging circuit. A second switch discharges the capacitor through a detonator.

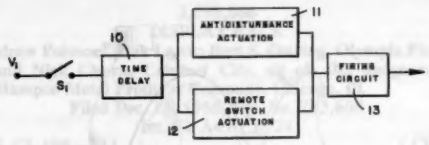
3,598,056
FUZE

Gaylon L. West; Robert H. Forster, and Bernard M. Jones, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 19, 1968, Ser. No. 786,838
Int. Cl. F42c *11/06*
U.S. Cl. 102—70.2 **4 Claims**

A fuze having an electronic arming delay timer, an antidisturbance firing mechanism and a remote firing

mechanism, wherein either firing mechanism is capable of

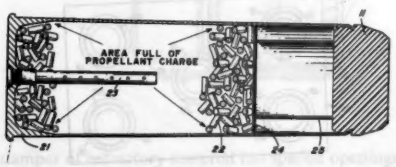


causing detonation of a squib.

3,598,057
CANISTER SMALL ARMS CARTRIDGE
Richard R. Potter, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy
Filed Sept. 25, 1968, Ser. No. 762,464
Int. Cl. F42b *13/18*
U.S. Cl. 102—91 **3 Claims**

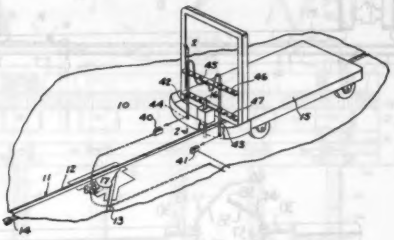
A cylindrical canister sized so that it will fit into a standard cartridge case and thereby can be fired from a rifled gun barrel. The canister contains a plurality of primary pellets stacked along its longitudinal axis and a plurality of secondary pellets spaced symmetrically about its longitudinal axis. The rifled gun barrel causes the canister to spin as it is ejected from the barrel, the centrifugal force thereby imparted to the secondary pellets acting on the forward end of the canister and tearing it open allowing aerodynamic forces to strip away the canister and free the pellets.

3,598,058
CARTRIDGE CASE PLUG FOR SEMIFIXED GUN AMMUNITION
Alvin Smith, Ooletic, Ind., assignor to The United States of America as represented by the Secretary of the Navy
Filed Apr. 24, 1969, Ser. No. 819,058
Int. Cl. F42b *9/18, 9/28*
U.S. Cl. 102—95 **2 Claims**



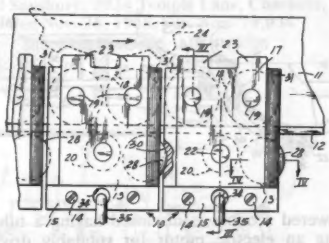
A cartridge case plug for semifixed gun ammunition having a skirt portion adaptable for fitting into a mouth of a cartridge case and having a tapered crown portion adjacent to said skirt portion, said plug being made of a rigid polyurethane foam having a density range of between 12 and 14.5 pounds per cubic foot after molding.

3,598,059
TOW TRUCK CONVEYOR SYSTEM
Edward J. Carney, Pittsburgh, Pa.; Karl R. M. Karlstrom, Roseville, Mich., and Ivan L. Ross, Birmingham, Mich., assignors to American Chain & Cable Company Inc., New York, N.Y.
Filed June 13, 1968, Ser. No. 736,781
Int. Cl. B65g *17/44*
U.S. Cl. 104—88 **15 Claims**



The tow truck conveyor system wherein a switch tongue is pivotally mounted at the area of juncture of a slotted main track portion and a slotted branch track portion and is movable from a first position, wherein it is held by a permanent magnet, which permits a tow truck having a tow pin extending downwardly in the slot to be carried by engagement with a chain conveyor undisturbed past the area of juncture. Upon signal from signal means on the two truck as it approaches the area of juncture, an electromagnet is energized which counteracts the force of the permanent magnet to permit a spring to move the switch tongue to a second position causing the tow truck to be deflected along the branch track portion.

3,598,060
CONVEYOR STRUCTURE
John Chitra, Jr., 5801 S. Francisco, Chicago, Ill.
Filed July 22, 1969, Ser. No. 843,498
Int. Cl. B65g *35/08*
U.S. Cl. 104—168 **10 Claims**

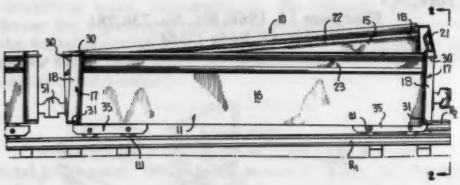


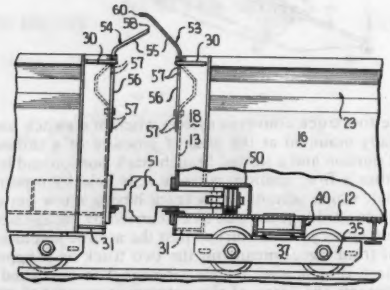
For a conveyor system having track means and conveyor driving means, a train of freely separable conveyor units has means for guided running along track means. Means such as rack teeth on the units are engageable with driving gears for moving the train along the track. Each unit has means such as a ball for freely separable articulated thrusting contact with the next adjacent unit to enable movement around turns in the track. Any one or more of the units in the train may be freely switched from one track to another.

3,598,061
TORSIONALLY FLEXIBLE MINE CAR
Henry Fort Flowers, 3023 Del Monte Drive, Houston, Tex.
Filed Sept. 18, 1968, Ser. No. 760,476
Int. Cl. B61d *11/02*
U.S. Cl. 105—364 **15 Claims**

This disclosure relates to a mine car having an outwardly opening wall at each of the four corners thereof for per-

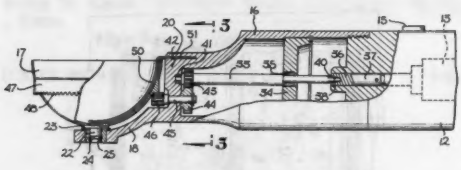
mitting relative torsional flexing of the car body, and further functioning to provide an area where a switchman can ride the car in a safer position than is presently conventionally





provided, the latter function being produced by a supporting platform and a handle positioned within said outwardly opening wall.

3,598,062
FOOD PRODUCT SCOOPER
Edward Weinstein, 20310 Clark St., Woodland Hills, Calif.
Filed June 6, 1969, Ser. No. 830,937
Int. Cl. A47j *43/28*
U.S. Cl. 107—48 H **5 Claims**



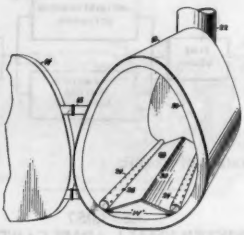
A powered scooper is disclosed having a tubular handle enclosing an electric motor for rotatably driving a bowl member mounted on the extreme end of the handle. A gear train is provided comprising a pinion gear driven by the drive shaft of the motor which is engaged with a ring gear carried about the midsection of the bowl. The circular periphery of the bowl is formed with a cutting edge adapted to separate a portion of the food bulk from its surrounding bulk.

ERRATUM

For Class 107—48 see:
Patent No. 3,598,202

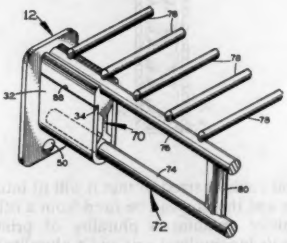
3,598,063
FILLER PLATE FOR INCINERATOR
Lyle F. Kalkhof, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Nov. 18, 1969, Ser. No. 877,713
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 R **3 Claims**

A high temperature incinerator having a combustion chamber with a temporary hearth inclined downwardly toward air supply pipes at the sides thereof whereby combustible material placed thereon will slide or roll down the



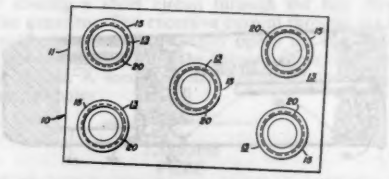
hearth toward said air supply pipes to effect its through combustion and subsequent elimination.

3,598,064
SHELVING
Edward H. Stempel, Lighthouse Point, Fla., assignor to Belaco, Inc., Debray Beach, Fla.
Filed Aug. 11, 1969, Ser. No. 849,060
Int. Cl. A47b *3/00;* **A47f** *5/08*
U.S. Cl. 108—42 **4 Claims**



A shelf with a mounting structure for removable mounting of the shelf on walls of a room, the shelf including vertically spaced rods or bars at the front thereof, and the mounting structure including a wall mounting channel receiving the vertically spaced bars or rods. A spacer is provided between the rod or bar portions within the channel to brace the same.

3,598,065
PALLET STRUCTURE WITH SELF LOCKING LEG
Gerald H. Young, Closter, N.J., assignor to Westvaco Corporation, New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 850,593
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 **6 Claims**



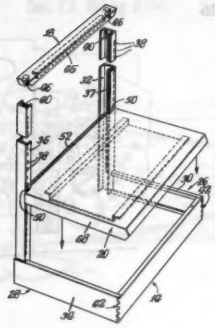
The pallet comprises a deck sheet to which is secured a plurality of spaced legs arranged in a pattern to permit handling of the pallet by a forklift truck or other material handling equipment. Each leg comprises a reinforced synthetic support which is preferably shaped like the frustum of a cone and which includes a flange area and locking slot at the upper end thereof. The pallet is formed by forcing the legs

through openings in the deck sheet where the legs are automatically locked in position.

3,598,066
DISPLAY RACK

Andrew Polezoes, Oak Lawn; Bert S. Ostring, Olympia Fields, and Nick Chura, Calumet City, all of, Ill., assignors to Stampco Metal Products Company, Chicago, Ill.

Filed Dec. 13, 1968, Ser. No. 783,600
Int. Cl. A47b *57/24*
U.S. Cl. 108—111 **1 Claim**

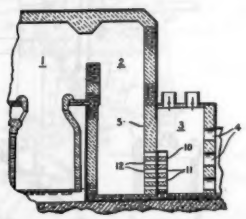


A display rack having a front base member, and L-shaped side frame assemblies pivotally connected to the front base member. The side frame assemblies may be resolved to positions along the forward face of the front base member for rack shipment and storage, and may be revolved to positions extending perpendicularly rearwardly from the front base member for rack assembly. A removable bottom shelf member serves to maintain the side frame assemblies and the front base member in rack assembled position, a rectangular vertical display board is engageable in the side frame assemblies and the shelf member, and a cap member is releasably secured across the upper ends of the side frame assemblies.

3,598,067
DAMPER FOR HIGH TEMPERATURE OR CORROSIVE GASES

Allen J. Jones, Fall Creek, Oreg., assignor to Michel Lumber Company, Lake Oswego, Oreg.

Filed Apr. 6, 1970, Ser. No. 25,974
Int. Cl. F23l *13/06*
U.S. Cl. 110—163 **10 Claims**

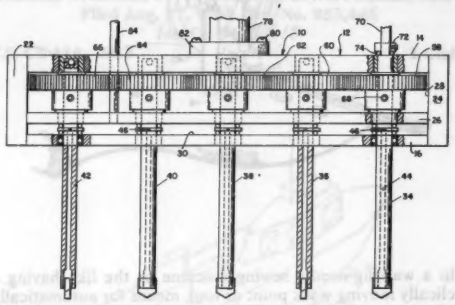


A damper of refractory material has spaced openings to register with similar openings in a furnace wall when the damper is in open position. A short horizontal movement of the damper shifts the damper openings out of register with the wall openings to modulate or shut off the gas flow. The damper is moved by a cylinder and piston actuator. The damper is preferably suspended by long vertical rods having pivotal support a considerable distance above the damper or it may be supported on rollers or other suitable means.

3,598,068
SOIL TREATING APPARATUS

Carl O. Rosendahl, 2426 33rd Ave, San Francisco, Calif., and Lynn L. Hursh, San Francisco, Calif., assignors to Clyde J. Smart, Reno, Nev., by said Rosendahl

Filed May 19, 1969, Ser. No. 825,700
Int. Cl. A01c *23/02;* **A01b** *45/02*
U.S. Cl. 111—7.1 **2 Claims**

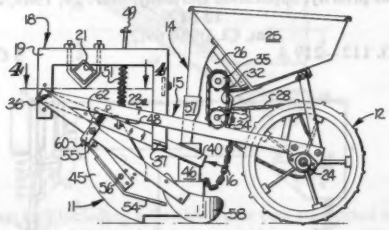


Soil treating apparatus including a body defining a chamber, a plurality of rotatably mounted drills carried by the body and projecting downwardly therefrom, each of the drills having a central bore communicating with the body chamber, handle means fixed to the body and projecting upwardly therefrom, means for rotatably driving the drills, and means for supplying fluid to the body chamber for flow through the central bores of the drills.

3,598,069
PLANTER WITH INDEPENDENTLY MOVABLE PRESS WHEEL AND FURROW OPENER

John C. Hatcher, 7525 Valley Brook Drive, Charlotte, N.C., and Ferrel Sansbury, 2934 Temple Lane, Charlotte, N.C.

Filed Nov. 26, 1968, Ser. No. 779,034
Int. Cl. A01c *5/06;* **A01b** *49/06*
U.S. Cl. 111—85 **4 Claims**



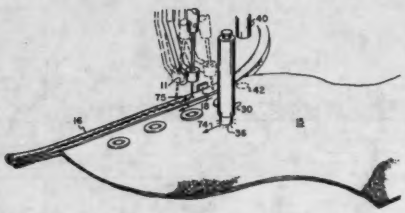
An agricultural seed planter in which independent mounting of a press wheel means and a planting furrow opening means facilitates movement of the planter over uneven ground while mounting of a seed dispensing means, for depositing seed into a planting furrow opened by the furrow opening means, to overlie the press wheel means imposes a gravitational force downwardly thereon to aid in maintaining traction and in tamping closed furrows into which seed has been dropped.

3,598,070

DRAG-STEERING WALKING-NEEDLE MACHINE

Edward D. Rosenberg, Levittown, N.Y., assignor to Ivanhoe Research Corporation, New York, N.Y.

Filed Mar. 25, 1970, Ser. No. 22,625
Int. Cl. D05b *27/20, 27/26*
U.S. Cl. 112—205 11 Claims



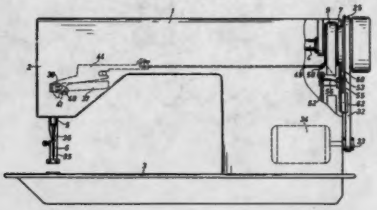
In a walking-needle sewing machine or the like having a cyclically moving work point or tool, means for automatically feeding a curvilinear edge of a workpiece beneath the tool including means adapted to establish the position of the curvilinear edge with respect to the work point, and a drag-steering means activated thereby. The drag-steering means comprises in a preferred embodiment a spring-loaded contact face that reciprocates synchronously with the needle, normally lightly contacting the surface of the workpiece at a point laterally spaced from the work point. When activated, the drag-steering means exerts a firm restraining force on the workpiece so that the workpiece is retarded by and traces a shortened path under the point of contact of the drag-steering means as the workpiece is advanced through the machine by the walking needle and advancement mechanism, and the edge thereof rotates towards the work point. The material is guided or caused to rotate in the opposite direction as may be required by means of a guide or fence on the side of the needle opposite from the drag-steering means.

3,598,071

ELECTRICALLY DRIVEN SEWING MACHINE WITH MEANS FOR STOPPING THE MACHINE IN A PREDETERMINED POSITION OF THE NEEDLE BAR

Lucian Luczak, Karlsruhe, and Gunter Meier, Weingarten, both of, Germany, assignors to Firma G. M. Pfaff Ag, Kaiserslautern/Pfalz, Germany

Filed Mar. 11, 1970, Ser. No. 18,623
Claims priority, application Germany, Mar. 29, 1969, G 69 12 817
Int. Cl. D05b *69/22*
U.S. Cl. 112—219 A 5 Claims



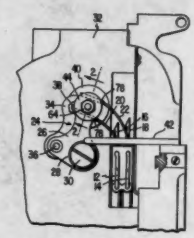
Arrangement for stopping the needle bar in a predetermined position on sewing machines with electrical motor drive means, where upon turning off the machine in a random position of the needle bar with a hand lever by way of a transfer lever of limited range of movement and a switch lever, a disconnecting element connected therewith is swung into the path of rotation of a retarding member that rotates with the arm shaft and a switch in the motor circuit are actuated so that by way of the switch 62 which is secured thereto the switch lever 60 rests in a force transmitting manner against the transfer lever 55 and the retarding member 11, 14 has an annular abutment surface 15, 16 that is interrupted by a disconnecting groove 69 for the disconnecting element 68.

3,598,072

NEEDLE CARRIER FOR TANDEM NEEDLE SEWING MACHINE

George B. Armstead, Jr., Glastonbury, Conn., assignor to The Merrow Machine Company, Hartford, Conn.

Filed Feb. 12, 1970, Ser. No. 10,708
Int. Cl. D05b *55/02*
U.S. Cl. 112—226 5 Claims



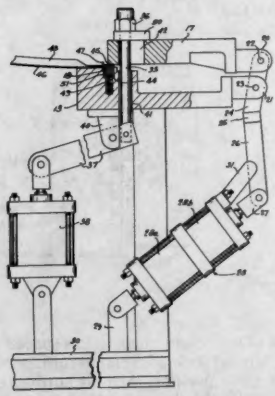
A needle carrier for an overseaming machine having a pair of spaced needles aligned in the direction of feed of the workpiece through the machine. The needle carrier includes a head portion having a flat vertical face with an elongated keyway formed therein, and a clamping plate having an elongated key formed on one surface is releasably mounted on the head with the key projecting into the keyway. A pair of grooves are formed in the plate, one on each side of the key, to engage and position the shanks of the pair of needles for clamping between the plate and the flat face on the head portion of the carrier. Any desired needle spacing may readily be obtained by employing a clamping plate having grooves appropriately spaced.

3,598,073

ASSEMBLING MACHINE

Edouard R. St. Denis, 8787 Riverside Drive, East Windsor, Ontario, Canada

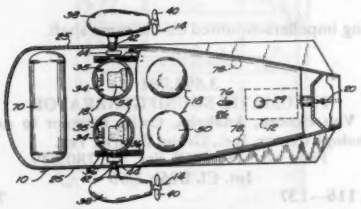
Filed June 16, 1969, Ser. No. 833,405
Int. Cl. B21d *39/02*
U.S. Cl. 113—54 6 Claims



A machine for securing two-preformed metal panels together into a unitary hollow structure, consisting of a table upon which the panels are laid in superimposed nested rela-

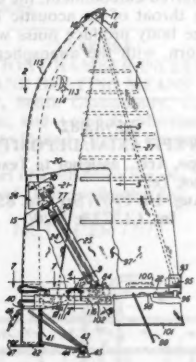
tionship with an upstanding locking flange of one panel encompassing a marginal edge of the other panel. A flange bending member is supported above the table by means of a spring biased guide member projecting out of the table surface and includes both a bevelled and a horizontal flange engaging surface. The flange bending member is movable laterally and vertically by means of levers and air cylinders.

3,598,074
SUBMERSIBLE VEHICLE
James M. Schubert, 2764 N.E. 14th St., Fort Lauderdale, Fla.
Filed Feb. 11, 1969, Ser. No. 798,319
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 **11 Claims**



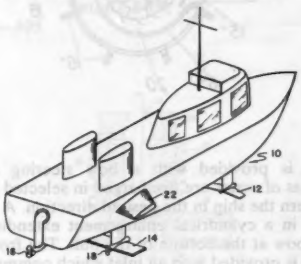
A high speed marine vehicle which has a hydrodynamically balanced hull capable of being submerged with a first propulsion system for high speed surface operation, a second propulsion system for underwater propulsion and maneuvering, and a number of releasable hermetically sealed high wall strength compartments. Each compartment may have appropriate controls for the operation of the vehicle.

3,598,075
SAILBOAT AIRFOIL SAIL AND MAST ASSEMBLY
Clarence E. Kenney, 119 Stuart Road, Racine, Wis.
Filed Feb. 13, 1970, Ser. No. 11,051
Int. Cl. B63b *35/00*; B63h *9/00*
U.S. Cl. 114—39 **10 Claims**



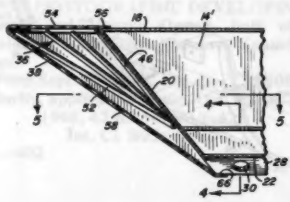
A sailboat mast assembly including a curved mast and a sail draped thereon to extend to both sides of the mast and leewardly thereof. Two booms are pivotally mounted at the base of the mast and are attached to the lower edges of each portion of the sail on each side of the mast, and the booms can be pivoted upwardly into compact position with the mast and they can be swung horizontally away from the mast to spread the sails apart for downwind sailing. Struts extend between the mast and the booms for tensioning the sail. Pulley and rope combinations are applied to the mast and booms for aligning these parts with respect to each other in the plane of the curvature of the mast and in the horizontal swinging of the booms. A bearing structure is mounted on the boat for the upright support of the mast and for quick and easy installation of the mast and sail assembly onto the boat.

3,598,076
AUXILIARY ROLL STABILIZER FOR HYDROFOIL CRAFT
Frederick N. Saxton, 10712 Rock Run Drive, Potomac, Md.
Filed Aug. 27, 1969, Ser. No. 853,446
Int. Cl. B63b *1/18*
U.S. Cl. 114—66.5 **1 Claim**



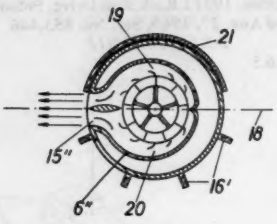
In a high speed watercraft of the hydrofoil type having foil appendages extending beyond and below the perimeter of the hull of the craft, stabilizing members for decreasing the roll angle of the craft in the event of a structural failure of the foil appendages, a control malfunction, or other damage causing the craft to assume an excessive roll angle.

3,598,077
FLEXIBLE BOW CONSTRUCTION
John Van Veldhuizen, 31601 S.W. 197th Avenue, Homestead, Fla.
Filed Oct. 20, 1969, Ser. No. 867,599
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A **11 Claims**



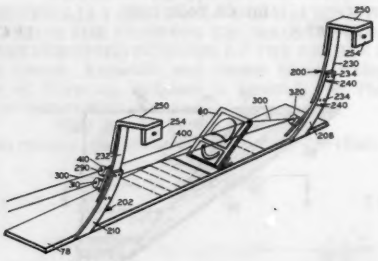
A boat hull including a flexible outer bow supported in forward spaced relation relative to a rigid inner bow structure with a cushion of air under pressure maintained between the rigid inner bow and the inner surfaces of the flexible outer bow. The hull includes generally flat forward bottom surfaces which join with the lower portions of the rigid inner bow structure and opposite side air plenum chambers to which large quantities of air under pressure is supplied. The forward portions of the side plenum chambers are communicated with opposite sides of the bow chamber defined between the inner bow and the flexible bow for inflating the latter and the lower transverse portions of the flexible bow are not sealingly secured to the corresponding portion of the rigid bow whereby air from the bow air chamber is discharged rearwardly beneath the forward bottom surfaces of the hull.

3,598,078
STEERING DEVICE FOR SHIPS AND OTHER CRAFT
Wolfgang Baer, Am Hardt, Germany, assignor to Firma J. M. Voith GmbH, Heidenheim, Germany
Filed Mar. 10, 1969, Ser. No. 805,587
Int. Cl. B63h *25/46*
U.S. Cl. 114—151 **10 Claims**



A ship is provided with a bow steering arrangement wherein jets of water are discharged in selected directions in order to turn the ship in the desired direction. A rotary pump is housed in a cylindrical enlargement extending forwardly from the bow at the bottom of the hull. The front of the enlargement is provided with an inlet which communicates with an axial inlet for the rotary pump. The pump discharges a stream in substantially a radial direction through a casing which is rotatable about the rotary axis of the pump and positionable to direct a stream of pumped water in one of at least two different directions.

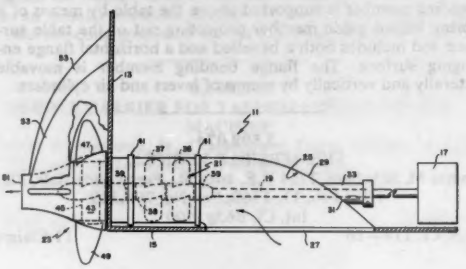
3,598,079
BOAT STEERING SYSTEM
Marvin A. Cudley, 9465 Emmet, Omaha, Nebr.
Filed Oct. 6, 1969, Ser. No. 863,961
Int. Cl. B63h *21/26*
U.S. Cl. 114—153 **12 Claims**



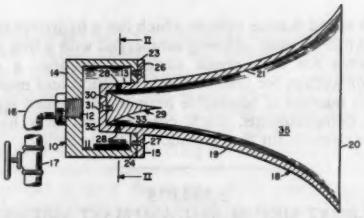
A boat having a steering system comprising a steering member such as the handle of an outboard motor, a foot pedal disposed in a portion of the boat forwardly of the steering member, the upper portion of the foot pedal being movable forwardly and rearwardly of the boat and a pulley and cable system interconnecting the pedal and steering member in a manner such that as the upper portion of the pedal is moved forwardly or rearwardly, the steering member is moved toward one side or the other of said boat.

3,598,080
MONOSHAFT PROPELLER WATER-JET
Curtis E. Shields, 1013 Fireside Lane, Virginia Beach, Va.
Filed July 29, 1969, Ser. No. 845,846
Int. Cl. B63h *11/02*
U.S. Cl. 115—14 **3 Claims**

A marine propulsion system providing a semisubmerged supercavitating propeller rotating coaxially with water jet-producing impellers mounted on the same shaft.

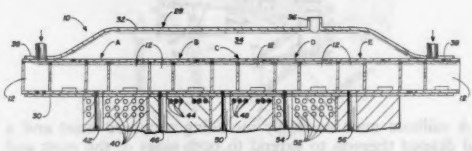


3,598,081
PNEUMATIC SOUND GENERATOR
John J. Van Houten, Anaheim, Calif., assignor to Advanced Technology Center, Inc., Grand Prairie, Tex.
Filed Nov. 29, 1968, Ser. No. 780,039
Int. Cl. B06b *3/00*
U.S. Cl. 116—137 **7 Claims**



A noise generator capable of producing random, wide-frequency band noise and in which at least one jet of air is directed against a surface of a body such that the air jet is broken up into intense turbulence and such that noise is produced. In a preferred embodiment, the body is immovably located within the throat of an acoustic horn, and air jets directed against the body produce noise which is efficiently coupled, by the horn, with the atmosphere ambient to the horn mouth.

3,598,082
CONTINUOUS EPITAXIAL DEPOSITION SYSTEM
Warren Rice, Tempe, Ariz., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 14, 1969, Ser. No. 850,015
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 **6 Claims**



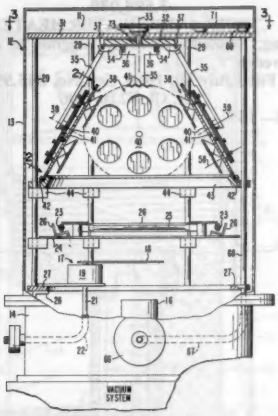
An epitaxial deposition system includes slice transporting boats which index individual slices between work stations. At the work stations, the temperature of the slices is controlled and the boats are sequentially filled with various gases, including an etching gas and a deposition gas. The work stations are surrounded by a sealed enclosure which receives gases discharged from the boats.

3,598,083

COMPLEX MOTION MECHANISM FOR THIN FILM COATING APPARATUSES

Robert F. Dort, Palo Alto; James R. Skinner, Cupertino, and Hany E. Cottrell, Los Gatos, all of, Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Oct. 27, 1969, Ser. No. 869,746
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 9 Claims



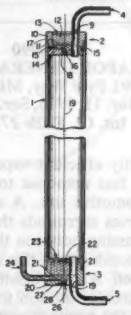
Apparatus is described for providing complex rotation about three axes of a plurality of objects being coated by deposition. The apparatus includes a frame adapted to be supported within a conventional deposition coating chamber having a source providing within the chamber an atmosphere of molecularly-sized particles of the desired coating material. A substrate holding disc having a face to which a plurality of substrate objects can be secured is mounted to the frame for rotation with the face in line-of-sight of the material source. The disc is mounted to the frame for orbiting about an axis which extends toward the source and rotation about its own axis. Each of the substrate object supporting members on the face of the disc is rotatably mounted thereon for rotation of the surface of the object to be coated about an axis which is oblique to the source. A prime mover is provided causing rotation about the various axes during the coating operation with the result that the surfaces being coated of the substrate objects will receive a uniform coating irrespective of irregularities in such surfaces.

3,598,084

VAPOR DEPOSITION CHAMBER INCLUDING SEALING AND HEATING MEANS

James Y. Whittier, South Glastonbury, Conn.; Roy Fanti, Springfield, Mass., and Asaph U. Merriam, East Hartford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation-in-part of application Ser. No. 549,428, May 6, 1966, now abandoned. This application Dec. 2, 1969, Ser. No. 881,568
Int. Cl. C23c *13/12*
U.S. Cl. 118—49.5 5 Claims



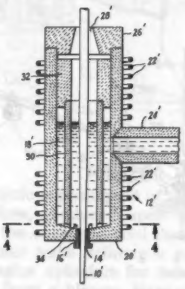
There are provided an apparatus, closure means therefore, for continuously effecting the pyrolytic deposition of boron on an electrically conductive substrate. The apparatus comprises a vertical tubular reactor chamber, novel closure means on both the top end and bottom end of the chamber which operate by capillary principle to retain an electrically conductive fluid serving as both a seal and an electrical contact for heating purposes and which include passageways for cooling and reactant gases, inlet means for feeding cooling and reactant gases into the reactor through said closure means, and outlet means for exiting excess cooling and reactant gases and byproduct gases from said chamber.

3,598,085

DIP FORMING APPARATUS

Roland P. Carreker, Jr., Schenectady, N.Y., assignor to General Electric Company

Division of Ser. No. 550,237, May 16, 1966, Pat. No. 3,466,186. Filed Oct. 11, 1968, Ser. No. 766,782
Int. Cl. B05c *3/12*
U.S. Cl. 118—405 1 Claim



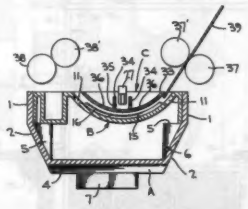
In a dip crucible apparatus for accreting molten metal onto a moving core rod passing through a crucible containing molten metal, an annular baffle is disposed concentrically to the crucible wall defining a reservoir of molten metal and surrounds the core rod. The baffle has a plurality of openings at its lower end, and a feed inlet to the crucible is positioned below the upper edge of the baffle but above the openings in the baffle. Molten metal introduced to the crucible flows downwardly between the crucible walls and the baffle and countercurrently with the baffle.

3,598,086

ELECTRONIC PHOTOGRAPHIC DEVELOPING DEVICE

Teizo Kushima, and Masaya Ogawa, both of Abeno-ku, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

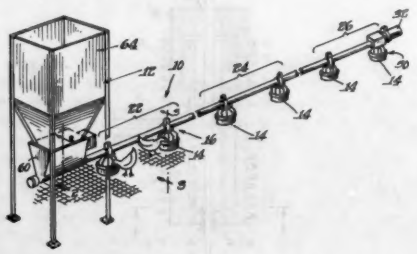
Filed Sept. 10, 1968, Ser. No. 758,808
Claims priority, application Japan, Oct. 7, 1967, Jan. 31, 1968, 42/85,549;43/6,423
Int. Cl. B05c *11/10*
U.S. Cl. 118—602 3 Claims



The developing device consists of a developing tank and an arch-shaped developing tray and a similarly arch-shaped developing terminal. The developing solution is sent upwards onto the developing terminal by a pump and the toner in the developing solution is charged with the polarity opposite to he latent image charge on the photosensitive paper. The said toner flows from the developing terminal into the developing tray to a given level, and the photosensitive paper is sent

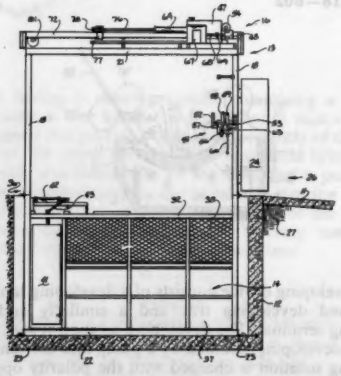
through between the developing tray and the developing terminal. The surface of the developing tray includes ridges which diverge in the direction in which the photosensitive paper is sent, and the ridges are divided into two sets in such a way that the ridges of the first set come in between the ridges of the second set so that the developing solution may flow among the ridges. In the developing terminal on top of the developing tray are cut gutter-shaped holes, through which the developing solution flows in parallel with the longer sides of the developing terminal and approximately at right angles with the direction in which the photosensitive paper is sent. Parting strips are mounted parallel with the gutter-shaped holes.

3,598,087
RESTRICTED FEEDING APPARATUS
Forrest L. Ramser, Milford, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.
Filed Mar. 17, 1969, Ser. No. 807,679
Int. Cl. A01k *05/02*
U.S. Cl. 119—51.11 **14 Claims**



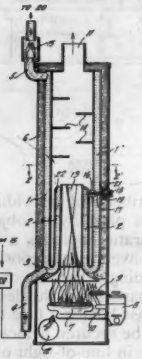
Feed dispensing apparatus of the automatic type which provides for the restricted feeding of poultry or the like, viz., the supplying of a predetermined quantity of feed at a preselected period. The apparatus includes a storage hopper, conveyor means, feed dispensing stations and a control system to achieve the desired end result. Said control system provides means whereby feed will be supplied to the poultry on demand, but upon the dispensing of a preselected quantity of feed, the apparatus is disabled until the next feeding cycle. In addition, there are means to achieve equal distribution of the feed along a conveyor line.

3,598,088
LIVESTOCK DIP APPARATUS
Jim H. Bowman, 2052 E. Second St., Fremont, Nebr.; Ralph L. Bowman, 1020 E. 11th St., Emporia, Kans., and Keith A. Moeller, Hooper, Nebr.
Filed Nov. 21, 1968, Ser. No. 777,718
Int. Cl. A01k *29/00*; **A61d** *11/00*
U.S. Cl. 119—158 **7 Claims**



A livestock dip apparatus having an on-ramp, a frame, a tank disposed under the frame, a vertically movable cage disposed in the frame and over the tank, hydraulic means for raising and lowering the cage into and out of the tank, and a combination drain basin and off-ramp. The cage has at least one swingable door hingedly secured thereto which is operable to agitate the solution contained in the tank, and an emergency hatch formed in the roof to reach the livestock in event of failure of the raising and lowering means.

3,598,089
CIRCULATING WATER HEATER
Erik Henning, Enskede, Sweden, assignor to AB Pulsvarme Nacka, Sweden
Filed July 30, 1969, Ser. No. 845,999
Int. Cl. F22b *7/00*
U.S. Cl. 122—165 **6 Claims**

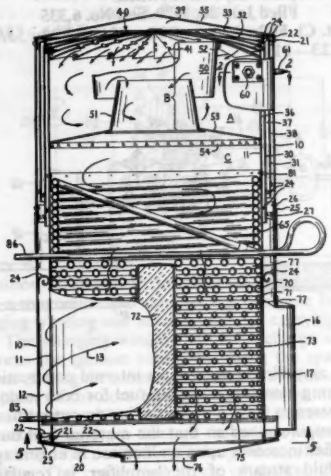


In a circulating water heating system the circulating water is subjected by alternate expansion and contraction of a steam or gas volume to pressure pulses which cause the water to flow through the circulation system. In the heater the steam or gas volume is enclosed in an inner chamber which is actuated by a source of heat and which is in communication with an outer chamber to which the incoming and outgoing conduits of the circulation system are connected. The novel features of the invention reside in the provision of an inlet conduit to the heater which is directly connected to the junction between inner and outer chambers at the lower portion of the heater, while the outlet conduit is connected to the upper portion of the outer chamber and is provided with a check valve arrangement. The upper portion of the inner chamber, which contains the steam or gas volume is contained, is selectively connected to the outer chamber via a controllable valve arrangement.

3,598,090
VAPOR GENERATOR
Richard J. Smith, 8591 Pyle Way, Midway City, Calif.
Filed Mar. 11, 1970, Ser. No. 18,650
Int. Cl. F22b *27/08*
U.S. Cl. 122—250 **11 Claims**

A lightweight highly efficient vapor generator having low thermal inertia and fast response to varying load demands, particularly for automotive use. A series of radially spaced concentric heat sleeves surrounds the combustion chambers with incoming air passing between these sleeves for preheating the air used for combustion, this air providing heat insulation for the outer shell. An air register at one end of the shell imparts a swirling circular motion to the incoming air creating a vortex flow in the primary combustion chamber which continues on into secondary and tertiary combustion chambers. The wall of the tertiary combustion chamber is lined

with vapor superheat tubes which receive vapor from banks of vapor generating tubes near mid length position in the shell, and these tubes in turn receive liquid from preheater tubes at the opposite end of the shell. The combustion gases



pass between these tubes and exhaust from said opposite end of the shell. All radiant energy from the combustion chambers is intercepted and utilized with a minimum of loss to the outer shell.

3,598,091

SHELL-TYPE BOILERS

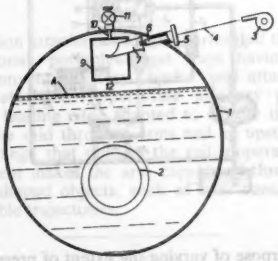
Harold Arthur Page, Annan, Scotland, assignor to Cochran & Company, Annan, Limited, Dumfriesshire, Scotland

Filed Oct. 9, 1969, Ser. No. 865,036

Claims priority, application Great Britain, Oct. 10, 1968, 48136/68

Int. Cl. F22d *1/28*

U.S. Cl. 122—414 **12 Claims**



This invention is a feed water supply arrangement for a boiler in which the water is mixed to a chamber in the boiler with steam or hot water for preheating the water prior to entering the water region, and dissolved noncondensible gases in the feed water are released and discharged to atmosphere.

3,598,092

AIR COOLING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

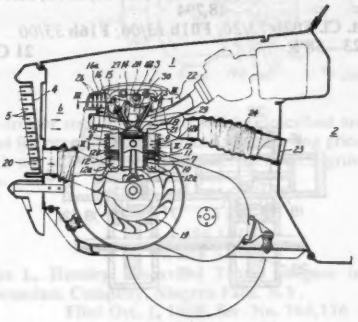
Soichiro Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 15, 1969, Ser. No. 857,660

Claims priority, application Japan, Sept. 14, 1968, Sept. 20, 1968, 66351;67653

Int. Cl. F02f *1/32, 1/34;* F01p *1/02*

U.S. Cl. 123—41.28 **1 Claim**



An engine of a vehicle is positioned in an engine compartment such that airflow, produced upon movement of the vehicle, passes over the engine to cool the same, the engine having inner and outer walls defining a passage extending along the line of engine cylinders for being supplied with separate cooling air from a blower. Heat conducting plates extend in the passage to form a plurality of passageways extending at right angles from the passage for the further flow of cooling air.

3,598,093

IMPELLER-CONNECTED ENGINE STARTING APPARATUS

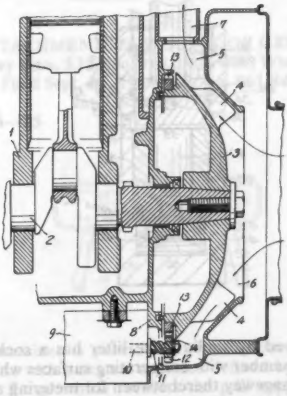
Minoru Tanaka, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 24, 1969, Ser. No. 860,765

Claims priority, application Japan, Sept. 24, 1968, 82001/68

Int. Cl. F01p *1/06;* F02n *11/00*

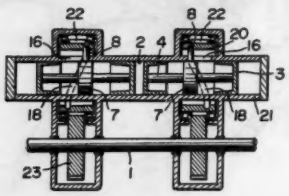
U.S. Cl. 123—41.31 **4 Claims**



An impeller is connected with a crankshaft of an engine and is positioned in a chamber for the conveyance of air, the impeller being formed with a gear. A starter motor drives a threaded shaft on which a pinion is mounted for travel

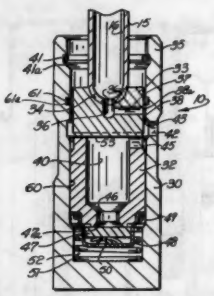
between a first position in engagement with the gear on the impeller and a second position out of engagement with this gear. When the starter motor is actuated the pinion travels to its first position and the crankshaft is driven through the impeller, whereas after the engine has started the pinion is driven to its second position.

3,598,094
CRANKLESS RECIPROCATING MACHINE
Daisaku Odawara, No. 520 Ueno Shiba-cho 5-cho, Sakai-shi, Japan
Continuation of application Ser. No. 717,518, Apr. 1, 1968, now abandoned. This application Mar. 16, 1970, Ser. No. 18,794
Int. Cl. F02b *75/26;* **F01b** *13/06;* **F16h** *33/00*
U.S. Cl. 123—58 R **21 Claims**



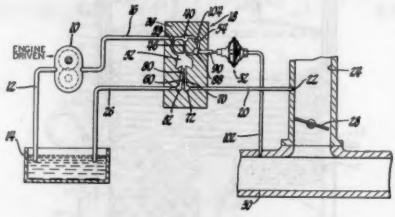
A crankless reciprocating machine which is provided with a mechanism other than a conventional crank mechanism for converting a reciprocating motion into a rotary motion or vice versa. The mechanism comprises at least one pin firmly connected to a piston or pistons so as to be immovable relative thereto and extending radially outwardly therefrom, and an endless cam mounted in a fixed part or a rotating part, said pin and said cam operatively connecting the reciprocating motion of said piston or pistons with the rotary motion of said rotating part.

3,598,095
HYDRAULIC VALVE LIFTER WITH TEMPERATURE COMPENSATING LUBRICANT METERING MEANS
H. Vincent Ayres, Saginaw, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Oct. 2, 1969, Ser. No. 863,081
Int. Cl. F01l *1/24;* **F01m** *9/10, 1/06*
U.S. Cl. 123—90.35 **3 Claims**



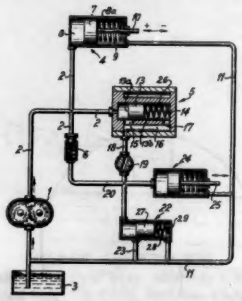
An improved hydraulic valve lifter has a socket member and a body member with cooperating surfaces which define a metering passageway therebetween for metering a flow of oil to an associated rocker arm assembly. The socket member has a higher coefficient of expansion than the body member. Therefore, when the temperature of the oil and the socket member increases the socket member will expand relative to the body to decrease the cross-sectional area of the metering passageway. Since the cross-sectional area of the metering passageway decreases as the temperature of the oil increases, the flow rate of the oil tends to remain constant even though the viscosity of the oil decreases.

3,598,096
FUEL METERING SYSTEM
Fred F. Timpner, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 28, 1970, Ser. No. 6,335
Int. Cl. F02n *37/14;;* **E02m** *69/00;* **F02n** *55/00*
U.S. Cl. 123—119 **7 Claims**



A fluid amplifier is used as an internal combustion engine fuel metering element, receiving fuel for both main and control fluid streams from a pump having an output flow proportional to engine speed so that the metered fuel output from the amplifier increases upon an increase in engine speed. The control fluid stream of the amplifier is regulated by a manually adjustable valve and by a valve responsive to induction system vacuum so that the metered fuel output from the amplifier increases upon an increase in manifold pressure.

3,598,097
HYDRAULIC REGULAR SYSTEM FOR FUEL INJECTION PUMPS
Franz Eheim, Stuttgart, and Konrad Eckert, Stuttgart-Bad Cannstatt, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Feb. 12, 1970, Ser. No. 10,919
Claims priority, application Germany, Feb. 27, 1969, P 19 09 793.9
Int. Cl. F02d *1/00*
U.S. Cl. 123—140 FG **3 Claims**

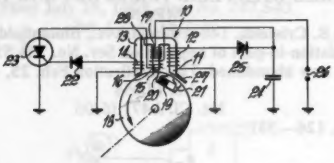


For the purpose of varying the extent of pressure response to r.p.m. changes in a hydraulic regulator system that controls the fuel delivery of a fuel injection pump, there is provided a pressure control valve and an arbitrarily variable throttle valve, both disposed in a conduit connecting the inlet and the outlet sides of a regulator pump of said system; said pressure control valve is gradually opened as the r.p.m.-dependent pressure increases; beyond a predetermined r.p.m., such opening is resisted by the pressure prevailing between said pressure control valve and said throttle valve.

3,598,098
IGNITION ARRANGMENT FOR INTERNAL COMBUSTION ENGINES

Gerhard Sohner, Geradstetten; Gert Strelow, Stuttgart-Stammheim, and Bernd Bodig, Leinfelden, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 1, 1969, Ser. No. 821,034
Claims priority, application Germany, May 2, 1968, Nov. 7, 1968, P 17 63 306.6;P 18 07 541.7
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **12 Claims**

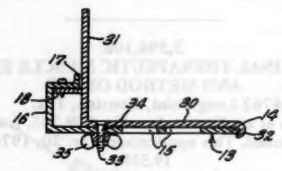


An ignition arrangement for internal combustion engines in which a magnetic core member has one pole for carrying the charging winding and another pole for carrying a control winding. The charging winding serves to charge a capacitor which stores the ignition energy for firing the spark plug of the engine. A magnet mounted on a rotatable disc is moved past the poles of the core member and thereby induces voltages, in sequence, within the charging and control windings. The capacitor discharges through the primary winding of an ignition transformer, with the discharge controlled by a control rectifier. The control electrode of the rectifier is connected to the control winding of the magnetic core member. Upon discharge of the capacitor, an ignition pulse for firing the spark plugs is induced in the secondary winding of the ignition transformer.

3,598,099
ATTACHMENT FOR THE THROWING ARMS OF TARGET TRAPS

George C. Luebkeman, 115 Mt. Nebo Road, Cleves, Ohio

Filed Dec. 22, 1969, Ser. No. 886,910
Int. Cl. F41f *5/00*
U.S. Cl. 124—43 **4 Claims**



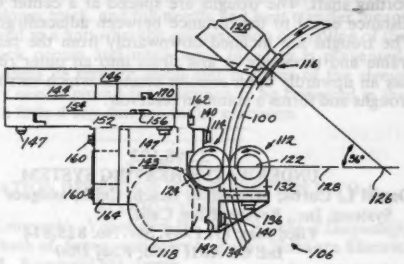
A conversion attachment for the perforated throwing arms of conventional, portable target traps having a rail for propelling conventional clay "birds," said attachment comprising a detachable imperforate auxiliary plate with a downturned leading edge adapted to overlie the perforated portion of the said throwing arms and an upstanding target propelling flange that renders the rail inoperative whereby the attachment makes the arm capable of throwing unconventionally shaped objects, such as beer cans, or the like, into acceptable trajectories.

3,598,100
DRESSER STRUCTURES

Thomas A. Deprez, and Alvin W. Snook, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Mar. 3, 1969, Ser. No. 803,751
Int. Cl. B24b *53/00*
U.S. Cl. 125—11 **17 Claims**

Rotary dresser structures are described with specific reference to novel characteristics for dressing cup-shaped grinding wheels of the type which are useful for grinding teeth in face couplings. The dressing structures include a pair of rotary dressers for shaping and dressing side surfaces of the cup-shaped grinding wheel together with a third rotary dresser which dresses an annular end of the grinding wheel.

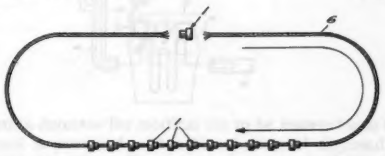


The dresser structures which will be described are especially useful for precision dressing and for grooving grinding wheels which are to be used in high heat formation grinding operations.

3,598,101
WIRE SAW

James L. Hensley, Knoxville, Tenn., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,116
Int. Cl. B28d *1/08*
U.S. Cl. 125—21 **6 Claims**

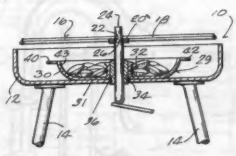


A wire saw for cutting stone and other materials, having cutting elements sleeved over multiple strand wires spliced together in endless fashion. The cutting elements are provided at intervals along the length of the wire and secured thereto by a forming operation. Each of the cutting elements has a tubular core, one end portion of which is secured to the wire and the opposite end portion is enlarged internally to be spaced from the wire, and this enlarged portion carries the abrasive cutting material. A coating may be applied over the wire and over the cutting elements for protection thereof.

3,598,102
ATTACHMENTS FOR OUTDOOR GRILLS

Edward Gary Fuss, 535 Grove St., Mayville, Wis.

Filed Sept. 29, 1969, Ser. No. 861,844
Int. Cl. A47k *37/07*
U.S. Cl. 126—25 **4 Claims**



A fuel container is provided for an outdoor grill in the form of a pan with a central aperture defined by an upstanding annular flange which receives the grill supporting shaft. The fuel container is provided with handles and a hinged sieve plate, which can be secured in a position partially enclosing the upwardly open fuel container to prevent loss of fuel when tilting the fuel container to facilitate the drainage of water used to extinguish the coals. Also disclosed is a grease receptacle which is adapted to be placed under a cir-

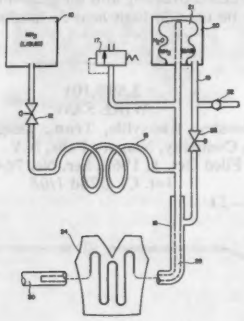
cular wire grill and which comprises two semicircular arrays of parallel spaced troughs. The inner ends of the troughs are connected to a rectangular wire frame which is secured to a central hub which is supported by a shoulder on the grill supporting shaft. The troughs are spaced at a center to center distance equal to the distance between adjacent grill wires. The troughs are inclined downwardly from the rectangular frame and terminate at and drain into an outer ring which has an upwardly open annular channel which surrounds the troughs and forms a common reservoir.

3,598,103

UNDERWATER HEATING SYSTEM

Daniel L. Curtis, Manhattan Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 19, 1969, Ser. No. 825,814
Int. Cl. A61f 7/06; F24j 1/00
U.S. Cl. 126—204 **9 Claims**



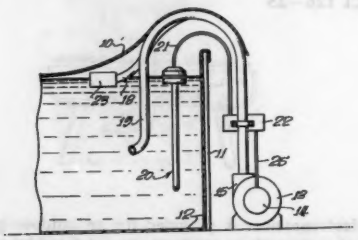
An underwater heating system for a swimmer or diver operating in frigid underwater environments wherein the heat is produced by reacting two chemicals such as ammonia and water. The chemical reaction takes place throughout the length of a heating tube filled with water located within a swimmer's diving suit or underwater chamber. The heat supplied to the swimmer is controlled by regulating the amount of ammonia mixing with water in the heating tube from a soaker line located within the heating tube.

3,598,104

SOLAR HEATING SYSTEM FOR SWIMMING POOLS

Richard M. Trostler, 1730 Woodbend Road, Claremont, Calif.

Filed Mar. 30, 1970, Ser. No. 23,679
Int. Cl. F24j 3/02
U.S. Cl. 126—271 **8 Claims**



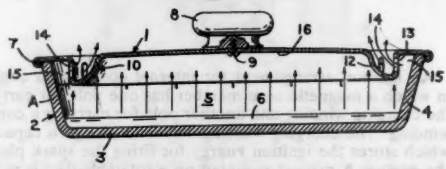
A solar heating system for swimming pools, particularly self-supporting above ground swimming pools, in which system a pool cover is used to absorb solar heat and conduct same to surface water in the pool, a pump is used to draw off the heated surface water and circulate it to subsurface areas in the pool to mix the heated surface water with cooler subsurface water, a temperature sensing probe and associated electrical circuitry is used to compare surface water temperature with subsurface water temperature, and the pump is activated when the sensing probe detects a surface water temperature higher than subsurface water temperature.

3,598,105

COVER FOR COOKING, HEATING OR FRYING VESSELS WITH FLUID TRANSPORT AND VENTING MEANS

Liborio B. Cristaldi, 148 Ashland Ave., Bloomfield, N.J.

Continuation-in-part of application Ser. No. 731,557, May 23, 1968, now abandoned. This application Feb. 25, 1970, Ser. No. 14,054
Int. Cl. A47j 36/06
U.S. Cl. 126—381 **14 Claims**



A cover or lid for a vessel designed for cooking or heating liquids and mixtures of liquids and solids which has means adapted both to vent vapor and noncondensible gases from the cooking or heating vessel and to permit additional liquid to be passed into the cooking or heating vessel without the necessity of removing the cover from the vessel. The cover or lid also is constructed to coact with the venting and transport means to condense vapors and return the liquid condensed to the liquid or mixture being cooked, heated or fried in the vessel. The cover or lid may consist of an annular rim section and a middle section. The middle section can be transparent and can be integral with, separable from or detachably connected to the annular rim section of the cover or lid.

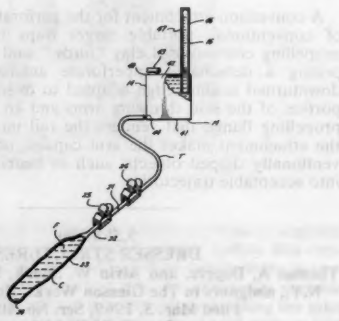
Additionally, the cover or lid with the transparent middle section may coact with a wiping means for cleaning the inner face of this section.

3,598,106

INTRAVAGINAL THERAPEUTIC MUSCLE EXERCISER AND METHOD OF USE

Eric Buning, 8762 Long Point, Houston, Tex.

Continuation of application Ser. No. 659,705, Aug. 10, 1967, now abandoned. This application Mar. 20, 1970, Ser. No. 19,555
Int. Cl. A61b 17/42
U.S. Cl. 128—2 R **2 Claims**



A longitudinally extending fluid filled deformable member adapted to be inserted into the vaginal canal to facilitate

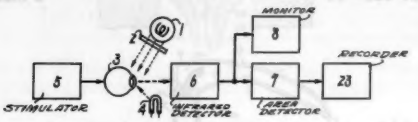
voluntary exercise of the muscles of the pelvic diaphragm and a fluid conduit connecting such device to an external indicator means to provide visible indicia of such muscular constrictions.

3,598,107

PUPILLARY MOTION OBSERVING APPARATUS

Satoshi Ishikawa, Tokyo; Masao Okabe, Hamamatsu, and Yuji Hakamata, Hamamatsu, all of, Japan, assignors to Hamamatsu T.V. Company, Limited, Hamamatsu, Shizuoka, Japan

Filed July 25, 1968, Ser. No. 747,543
Int. Cl. A61b 3/10
U.S. Cl. 128—2 1 Claim



A television system using an infrared vidicon is used for displaying the pupil of a human eye to provide a measure of pupil size. Line scanning video signals scanned across the pupil may be monitored and clipped at a predetermined threshold level to determine the width of the pupil and therefore the area of the pupil.

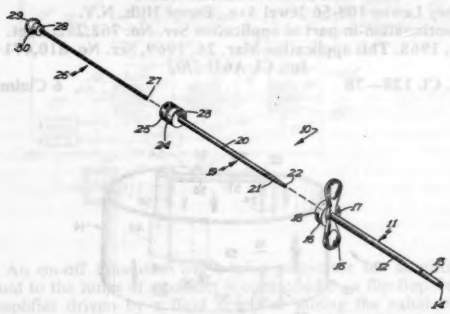
Line scans across the pupil are detected by an electronic system to provide an indication of pupil size.

3,598,108

BIOPSY TECHNIQUE AND BIOPSY DEVICE

Khosrow Jamshidi, 3146 Minnehaha Ave., Minneapolis, Minn.; William R. Swaim, 152 Taylor Ave., Fort Snelling, Minneapolis, Minn., and Harold E. Windschitl, 1275 MacArthur Ave., West St. Paul, Minn.

Filed Feb. 28, 1969, Ser. No. 803,193
Int. Cl. A61b 10/00
U.S. Cl. 128—2 B 5 Claims



A biopsy needle device and method of using the same includes an elongate needle having a tapered distal end portion which terminates in a distal cutting edge. An elongate sleeve member is inserted into the needle and corresponds in shape and length to the needle. An elongate stylet is positioned interiorly of the telescopically disposed needle and sleeve member and projects from the needle to close the distal end thereof so that the needle assembly may penetrate exterior tissue when a specimen is to be taken from a deeply located organ or tissue of a patient. The stylet is first removed and the biopsy specimen is collected in the sleeve member which is then removed from the needle while the needle is allowed to remain in place so that a heat transfer means such as a microcauter or a cryoprobe may be introduced into the needle. The distal end of the microcauter or cryoprobe projects into the biopsy track, and the needle and heat transfer means are removed as a unit whereby cauterization or cooling of the biopsy track occurs and intro-organ bleeding is prevented. The expanding or tapered distal end portions of the sleeve and biopsy needle permit the specimen to be collected in the sleeve with little if any damage to the specimen.

3,598,109

RADIATION DETECTOR FOR INSERTION INTO A BLOOD VESSEL

Tetsuji Kobayashi, Yokohama-shi, and Seiichi Takayanagi, Tokyo, both of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 11, 1967, Ser. No. 666,594
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 F 10 Claims

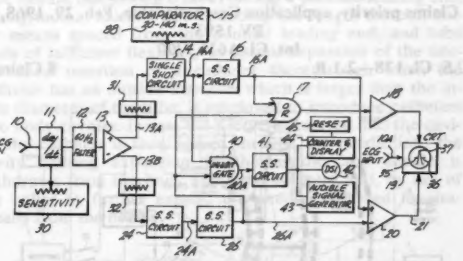
A radiation detector for medical use to be inserted into the blood vessel is provided with a blood channel disposed in parallel with the blood flow. A semiconductor element is placed in the blood channel to detect the radiations from the radioisotope introduced into the blood vessel, with the radiation-receiving face thereof exposed to the interior of the blood channel.

3,598,110

VENTRICULAR ARRHYTHMIA DETECTION SYSTEM

Karl W. Edmark, Seattle, Wash., assignor to Physic Control Corporation, Seattle, Wash.

Filed Apr. 10, 1969, Ser. No. 815,134
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 A 3 Claims



A system is disclosed for detecting the occurrence of a premature ventricular contraction in a patient or in the signals provided by a training apparatus which generates signals representing a premature ventricular contraction (PVC). The electrocardiograph signals from the patient or a training apparatus are applied via differentiating circuit and filter circuit to a logic system which operates to analyze the QRS signals to determine whether or not the QRS signal is a normal

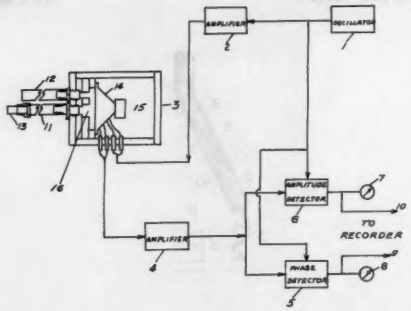
signal or whether it is the result of a PVC. Pulse generating circuits are used to define timing arrangements so that if the signal is the result of or represents a PVC then an alarm circuit is activated. Details of the logic circuitry and of a system wherein horizontal markers are provided on the cathode-ray tube display of the QRS signal to facilitate utilization of the equipment by a person unskilled in the electronic arts are provided.

3,598,111

TECHNIQUE AND APPARATUS FOR MEASURING AND MONITORING THE MECHANICAL IMPEDANCE OF BODY TISSUES AND ORGAN SYSTEMS

Alan R. Kahn, Cherry Hill, and Warren L. Childs, Willingboro, both of, N.J., assignors to Health Technology Corporation

Filed Dec. 9, 1968, Ser. No. 782,220
Int. Cl. A61b *5/08;* **G01n** *29/00*
U.S. Cl. 128—2.08 **9 Claims**



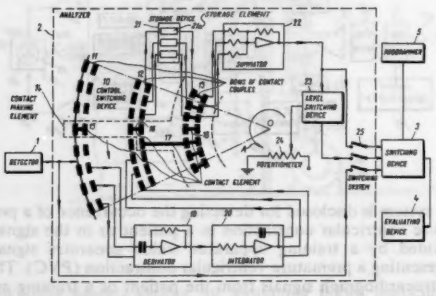
A technique and apparatus utilizing tuned mechanical and pneumatic principles for assessing the mechanical properties of body tissues and organ systems. The apparatus vibrates at a tuned frequency and is loaded by the specific tissue or organ system being assessed resulting in an impedance and a phase angle shift. From the above data, the resistive and reactive components of the measured impedance may be determined.

3,598,112

ARRANGEMENT FOR AUTOMATIC PERFORMING AND EVALUATING OF TEST OF THE ACTIVITY OF FUNCTIONAL SYSTEMS OF LIVING BODIES

Stepan Figar, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed Feb. 27, 1969, Ser. No. 802,912
Claims priority, application Czechoslovakia, Feb. 29, 1968, PV 1593
Int. Cl. A61b *5/00*
U.S. Cl. 128—2.1 R **8 Claims**



An arrangement for automatically performing and evaluating biological tests in which a detector for sensing the activities is connected to an analyzer. The analyzer having means for differentiating tests performed at predetermined normal conditions and at undesirable conditions. The detector providing variations in voltages and the analyzer having derivator and integrator means for obtaining a planimetric evaluation of the voltages. Final evaluation is obtained in an evaluating device deriving a signal from the analyzer via a switching device.

3,598,113

DISPOSABLE LARYNGOSCOPE CONSTRUCTION

William C. Moore, Skaneateles, and William S. Pilgrim, Port Byron, both of, N.Y., assignors to Welch Allyn, Inc., Skaneatiles Falls, N.Y.

Filed Oct. 9, 1968, Ser. No. 766,157
Int. Cl. A61b *1/26, 1/06, 1/24*
U.S. Cl. 128—11 **2 Claims**

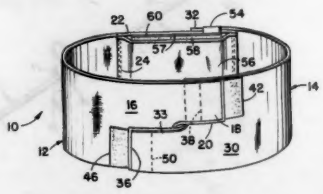
A disposable laryngoscope having a unitary plastic blade and handle. The handle is hollow and in use contains a light unit having batteries, a lamp and an operating switch. The light unit is not disposable and is removed for reuse before the blade and handle assembly is thrown away. The disposable part of the instrument includes a fiber optic bundle which carries light from the lamp within the handle to a point near the distal end of the blade.

3,598,114

ADJUSTABLE RIB BELT

Sidney Lewis, 108-56 Jewel Ave., Forest Hills, N.Y.

Continuation-in-part of application Ser. No. 762,292, Sept. 16, 1968. This application Mar. 26, 1969, Ser. No. 810,471
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **6 Claims**



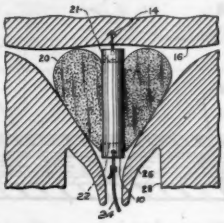
An adjustable two-piece rib belt made of elastic material and provided with fastening means for discrete circumferential size adjustment by overlapping connection of one end of one belt-piece member to one end of the other belt-piece member and a second circumferential size adjustment by overlapping textile adhesive connections of alternate flaps extending from the respective other side ends of the belt piece over the opposite belt piece. A removable back support pad is provided in a pouch arranged for positioning over the sacral or small-of-the-back region of the user.

3,598,115

INTRA-UTERINE CONTRACEPTIVE DEVICE

Herbert W. Horne, Jr., 1330 Boylston St., Chestnut Hill, Brookline, Mass.

Filed Apr. 8, 1969, Ser. No. 814,266
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 **14 Claims**



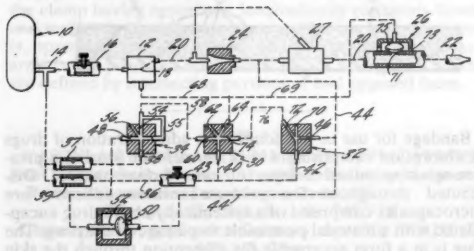
A contraceptive device has retaining means comprising a barb arranged to penetrate into the muscular wall of the uterus, to prevent accidental loss or ejection of the device. The device may also have an elongated shaft which is slotted transversely to receive a flexible vane. The vane is rolled on the shaft for insertion, and thereafter unrolls to engage the uterine walls. A ball-and-socket connection of the barb and the shaft permits the vane to unroll. The vane may be made of polyethylene, or a silico-organic rubber impregnated with contraceptive hormone chemicals. The vane is transversely slidable in the slot of the shaft to permit proper self-alignment with the form of the individual uterus.

3,598,116

RESPIRATOR WITH FLUID AMPLIFIERS

Joseph C. Peters, East Hartford, and Hermann Ziermann, Cheshire, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 17, 1969, Ser. No. 834,005
Int. Cl. A62b *7/04*
U.S. Cl. 128—145.5 **8 Claims**



An on-off inhalation valve of a respirator for admitting fluid to the lungs of a patient is controlled by a flip-flop fluid amplifier driven by a fluid amplifier during the exhalation cycle and by another fluid amplifier during the inhalation cycle.

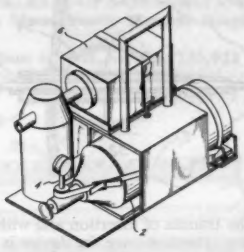
3,598,117

APPARATUS FOR MOUNTING RESPIRATOR EQUIPMENT

Ralph W. Cearly, Austin, Tex., assignor to South Coast Surgical Supply, Inc., Austin, Tex.

Filed Jan. 12, 1970, Ser. No. 2,006
Int. Cl. A61h *31/00*
U.S. Cl. 128—145.8 **8 Claims**

A frame is provided which comprises a base plate, a bin suitable for receiving an oxygen cylinder, a shock-mounted support plate for a medical respirator unit, a carrying arm, and detachable flexible straps for retaining each the oxygen



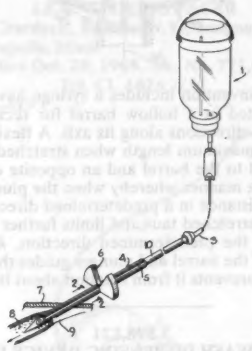
cylinder and the respirator unit on the frame but enabling the quick and efficient removal therefrom.

3,598,118

METHOD OF INTRODUCING AN INTRAVENOUS CATHETER INTO THE VASCULAR SYSTEM

Joseph E. Warren, Old Chester Road, Gladstone, N.J.

Continuation-in-part of application Ser. No. 564,935, July 13, 1966, now abandoned. This application Nov. 4, 1968, Ser. No. 778,914
Int. Cl. A61m *05/00*
U.S. Cl. 128—214.4 **2 Claims**



A needle comprising a tube, having a pointed leading end, a longitudinal hairline slot extending the length thereof, collar means spaced from the pointed leading end, and tube walls of sufficient flexibility to permit expansion of the needle upon insertion of a catheter therethrough when the catheter has an outside diameter which is larger than the inside diameter of the tube, is employed to introduce catheters into body cavities. In use, the needle is inserted into the cavity, the catheter is then passed through the needle into the cavity causing expansion of the needle, the needle is withdrawn from the body along the catheter and, by use of the collar to further expand the needle, removed longitudinally from the needle.

3,598,119

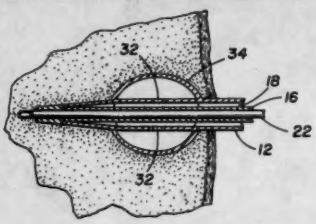
CONTINUOUS PARACERVICAL ANESTHESIA METHOD AND DEVICE

Charles A. White, 328 Highland Drive, Iowa City, Iowa

Filed Feb. 2, 1970, Ser. No. 7,763
Int. Cl. A61m *5/00*
U.S. Cl. 128—215 **10 Claims**

A medical instrument and method for use in obstetrical or gynecological analgesic procedures to allow the administration of a paracervical block continuously or intermittently

with only a single placement. The device has improved retention means, in the form of an inflatable bladder, which



minimizes the trauma of insertion and withdrawal while positively assuring retention once the device is inserted in place.

3,598,120

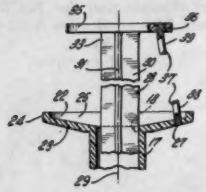
SYRINGE HAVING LIMITED PLUNGER MOVEMENT

Morris Mass, Kew Gardens, N.Y., assignor to Haematronics, Inc., New Rochelle, N.Y.

Continuation of application Ser. No. 680,172, Nov. 2, 1967, now abandoned. This application June 2, 1970, Ser. No. 41,750

Int. Cl. A61m *5/22*

U.S. Cl. 128—218 PA **6 Claims**



The present invention includes a syringe having a plunger movably mounted in a hollow barrel for reciprocal movement therein in directions along its axis. A flexible elongated member has a maximum length when stretched taut and has one end affixed to the barrel and an opposite end affixed to the plunger in a manner whereby when the plunger is moved a determined distance in a predetermined direction the flexible member is stretched taut and limits further movement of the plunger in the predetermined direction. A cooperating guide device of the barrel and plunger guides the plunger in a manner which prevents it from rotation about its axis.

3,598,121

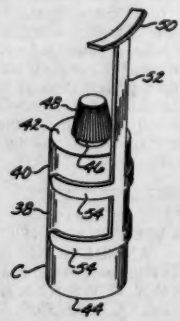
LIQUID EYEWASH DISPENSING DEVICE INCLUDING EYELID-ENGAGING MEANS

John Lelicoff, 1732 Norfolk Lane, Anaheim, Calif.

Division of Ser. No. 528,491, Feb. 18, 1966, Pat. No. 3,439,674. This application Dec. 12, 1968, Ser. No. 783,206

Int. Cl. A61m *1/00*

U.S. Cl. 128—233 **2 Claims**



An eyewash liquid dispensing device including a container on which an eyelid-engaging assembly is movably supported in an open position when a liquid is being applied to an eyeball.

3,598,122

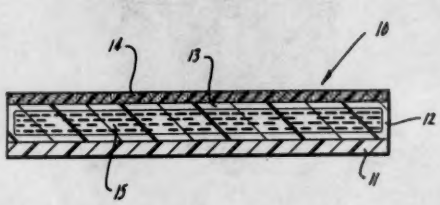
BANDAGE FOR ADMINISTERING DRUGS

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation

Filed Apr. 1, 1969, Ser. No. 812,116

Int. Cl. A61f *7/02*

U.S. Cl. 128—268 **15 Claims**



Bandage for use in the continuous administration of systemically active drugs by absorption through the skin or oral mucosa comprising a backing member having on one surface thereof a reservoir containing a systemically active drug. The reservoir has a wall distant from the backing member and permeable to passage of the drug. A pressure-sensitive adhesive layer, also permeable to passage of the drug, is carried by the reservoir. The drug is in a form acceptable for absorption through the skin or the mucosa of the mouth.

3,598,123

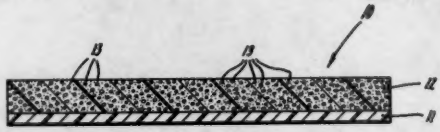
BANDAGE FOR ADMINISTERING DRUGS

Alejandro Zaffaroni, Atherton, Calif., assignor to ALZA Corporation

Filed Apr. 1, 1969, Ser. No. 812,117

Int. Cl. A61f *7/02*

U.S. Cl. 128—268 **13 Claims**



Bandage for use in the continuous administration of drugs by absorption comprising a backing member bearing a pressure-sensitive adhesive layer on one surface thereof. Distributed throughout the pressure-sensitive adhesive are microcapsules comprised of a systemically active drug encapsulated with a material permeable to passage of the drug. The drug is in a form acceptable for absorption through the skin or the mucosa of the mouth.

3,598,124

DRAINAGE CONTROL

Harold Willids Andersen, and Charles Harvey Harrison, both of Oyster Bay, N.Y., assignors to H. W. Andersen Products, Inc., Oyster Bay, N.Y.

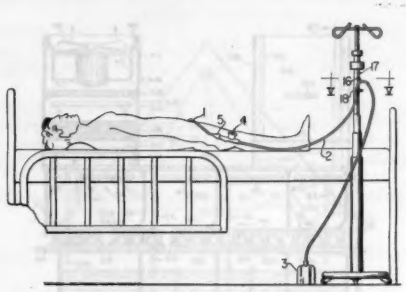
Continuation-in-part of application Ser. No. 473,917, July 22, 1965, now abandoned. This application Feb. 1, 1968, Ser. No. 702,391

Int. Cl. A61f *5/44*

U.S. Cl. 128—275 **2 Claims**

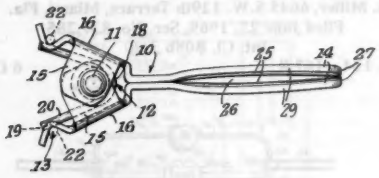
A method and apparatus for urinary drainage in which the normally closed system includes an adjustable upward course between the bladder and the downward course leading to a drainage receptacle, with the provision of venting means in the form of a one-way valve (e.g., flutter valve) in the upper portion of the system designated to admit atmospheric air

cyclically when the flow of liquid in the downward course causes negative pressure in the upward course, whereby the



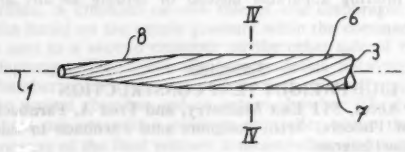
system is periodically emptied and permitted to refill in a simulation of normal physiological filling and emptying of the bladder.

3,598,125
ANEURISM CLAMP
James J. Cogley, 2214 Euclid Ave., Santa Monica, Calif.
Filed June 7, 1968, Ser. No. 735,355
Int. Cl. A61b *17/12*
U.S. Cl. 128—346 **3 Claims**



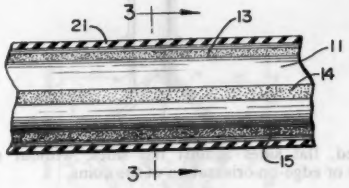
A surgical clamp for application to the neck of an aneurism to clamp the walls thereof to shut off blood flow or seepage from an artery on which such aneurism has formed, the clamp having oppositely, longitudinally concavely bowed, and resiliently biased clamping arms that are also transversely, oppositely convexly bowed, and the opposed faces of said arms being provided with a multiplicity of depressions that are defined by intersecting portions of said opposed faces.

3,598,126
VASCULAR CANULA FOR MEDICAL APPLICATIONS
Josef Hoeltzenbein, Munster, Westfalen, Germany, assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed July 25, 1968, Ser. No. 747,712
Claims priority, application Germany, Apr. 30, 1968, H 62 605/30k Gbm
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **6 Claims**



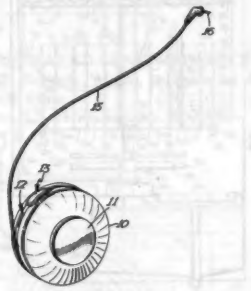
A vascular canula which is intended for insertion into a blood vessel. The canula includes a thin-walled tube made of silicone rubber. The tubing wall is reinforced with thin fibers to provide a canula which combines softness and flexibility with stability of shape.

3,598,127
CATHETER HAVING ANTIBACTERIAL SUBSTANCE THEREIN PROVIDED WITH MEANS PERMITTING SLOW RELEASE OF SAID SUBSTANCE
James G. Wepsic, Massachusetts General Hospital, Boston, Mass.
Filed June 6, 1968, Ser. No. 735,022
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 **6 Claims**



A catheter has an inner tube of nonpermeable rubber formed with V-shaped grooves extending along its length on the outside carrying antibacterial agents permeable through polysiloxane rubber that surrounds the V-shaped grooves. The antibacterial agents are permeable through the polysiloxane rubber. Upon diffusion through the polysiloxane layer the antibacterial agents help prevent infection caused by bacteria moving up the tube toward the bladder or other organ into which the catheter tube leads.

3,598,128
LEAD-STORING PACER
William M. Chardack, Buffalo, N.Y., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Oct. 28, 1968, Ser. No. 771,067
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **5 Claims**

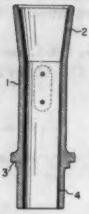


An implantable electrical medical device, especially useful for pediatric implantations, wherein encapsulated electrical circuitry which is adapted to be connected to a lead extending to an electrode connected to the body, has a groove or the like extending around the external periphery of the encapsulating substance, the groove being of sufficient dimension to releasably receive extra lengths of the lead supplied for growth of the body.

3,598,129
COIN RECEIVING AND STACKING DEVICE
Masaru Itoda, Hyogo-ken, Japan, assignor to Kabushiki Kaisha Kokuei Kikai Seisakusho, Hyogo-ken, Japan
Filed Oct. 22, 1968, Ser. No. 769,647
Claims priority, application Japan, Nov. 11, 1967, 43/95078
Int. Cl. G07d *9/00*
U.S. Cl. 133—1 A **2 Claims**

The inner wall surface of a tubular coin receiving and stacking device is lined with a metal sheet to provide a

passageway of smooth and durable surface for coins passed through it, whereby the coins are smoothly and reliably



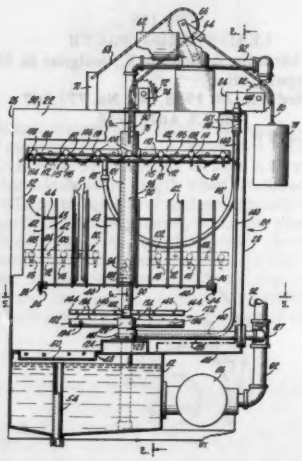
stacked, flat sides against flat sides, without nonparallel askew or edge-on orientation of the coins.

3,598,130

VERTICALLY MOVABLE SPRAY MECHANISM FOR WASHING MACHINE

Robert K. Nolte, Chatham, and Edwin Dana Cowles, Englishtown, both of, N.J., assignors to Metalwash Machinery Corporation, Elizabeth, N.J.

Filed May 10, 1968, Ser. No. 728,161
Int. Cl. B08b *3/02*
U.S. Cl. 134—99 **31 Claims**



A vertically movable mechanism having a plurality of wash and rinse nozzles is moved linearly between pans stacked on edge. The wash and rinse sprays alternately impinge on the surfaces of the pan in order to provide full cleaning coverage. An alternative rotary wash and rinse spray may be used for horizontally disposed bowls and utensils.

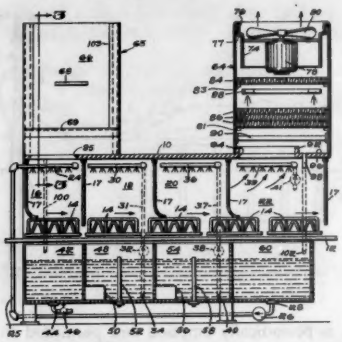
3,598,131

STEAM COLLECTION SYSTEM FOR DISHWASHING MACHINES

Clyde R. Weihe, Jr., Needham Heights, Mass., assignor to Adamation Inc., Newton, Mass.

Filed Aug. 12, 1969, Ser. No. 849,381
Int. Cl. B08b *15/02, 3/02*
U.S. Cl. 134—107 **13 Claims**

A system for collecting and condensing steam from dishwashers to recover the heat of condensation and to reduce the humidity in the dishwashing room. Steam is drawn from the dishwasher by a blower into a duct, and through a body of porous material against which sprays of water are directed. Condensed moisture is collected by a baffled sump and returned to a supply of rinse water, or otherwise utilized to



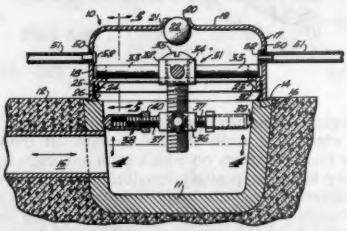
recover the heat of condensation of the steam. The airflow leaving the blower is discharged into the room at a reduced level of humidity.

3,598,132

AUTOMATIC JET-ACTION SWIMMING POOL CLEANER ATTACHMENT DEVICE

Eldon S. Miller, 6645 S.W. 129th Terrace, Miami, Fla.

Filed June 27, 1969, Ser. No. 837,285
Int. Cl. B08b *3/00*
U.S. Cl. 134—167 R **6 Claims**



A device for attachment to the bottom drain of swimming pools is described, comprising a cylindrical housing structure seatable and securable over the drain and having a plurality of radially outwardly extending flexible tubes. Operation is effected by directing the inlet flow of pool water in the filtering circulatory system to the bottom drain, whereat it passes under pressure through the housing structure to discharge at the open ends of the tubes with jet action. The resulting whipping about of the tubes at the bottom of the pool serves to maintain dirt particles in suspension for automatic removal by the filtering apparatus instead of settling as dirt and sludge.

3,598,133

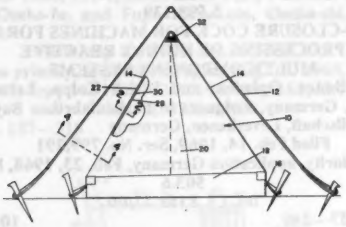
LIGHTWEIGHT TENT CONSTRUCTION

Jack C. Abert, 511 East Mulberry, and Fred A. Farnbach, both of Phoenix, Ariz., assignors said Farnbach to said Abert part interest

Filed Dec. 4, 1968, Ser. No. 781,122
Int. Cl. A45f *1/00*
U.S. Cl. 135—1 R **1 Claim**

A lightweight tent construction comprising a tent roof having an outer waterproof layer of thin lightweight material and an inner layer of insulating material, such as synthetic foam, or the like, wherein the waterproof layer may be of fabric or

plastic material of high tensile strength ranging in thickness between 0.004 and 0.010 inches, and wherein the insulating



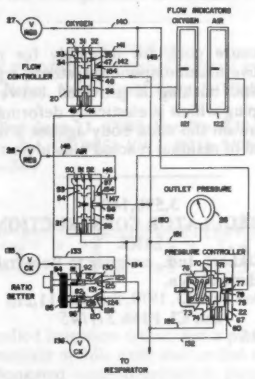
foam material may range in thickness between one sixty-fourth of an inch to one-eighth of an inch.

3,598,134

RATIO CONTROLLER FOR GASES

Louis A. Ollivier, Menlo Park, Calif., assignor to Veriflo Corporation, Richmond, Calif.

Division of Ser. No. 713,669, Mar. 18, 1968, Pat. No. 3,534,753. This application Mar. 16, 1970, Ser. No. 19,941
Int. Cl. G05d *11/03*
U.S. Cl. 137—7 **10 Claims**



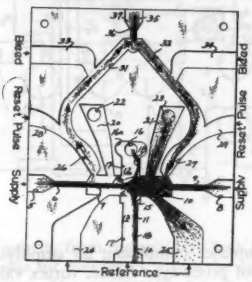
A mixture of two gases is supplied at any desired ratio, and a ratio once set is maintained over wide variations in pressure and during either continuous or intermittent flow. Two flow controllers are used, one for each gas, and each one comprises three stacked diaphragms to give flow as demanded by superimposing a command signal on a flow based on the differential pressure of each supply gas and the ratio-metering orifice. A chamber on one side of one diaphragm supplies bias based on the supply pressure while the command signal is sent to a second chamber on the other side of the same diaphragm. Two other diaphragms define between them a chamber open to the atmosphere and close off respectively the second chamber and an output chamber. The command signal originates in a pressure controller where the output pressure of the final mixture is measured against a reference pressure to obtain a command signal pressure from the original regulated supply of one of the two gases (both of which are supplied at substantially identical regulated pressure). This command signal is fed to the flow controllers through the ratio setter, and the other flow controller chambers are supplied from supply pressure through a constant orifice.

3,598,135

FLUID PULSE RESPONSIVE IMPACTING STREAM APPARATUS

Warren A. Lederman, Milwaukee, and Louis D. Atkinson, New Berlin, both of, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 26, 1970, Ser. No. 5,649
Int. Cl. F15c *1/20*
U.S. Cl. 137—81.5 **11 Claims**



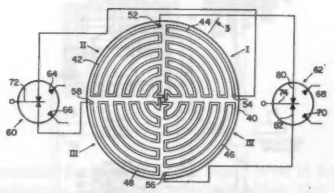
A pair of aligned and opposed main stream nozzles in the opposite end of a rectangular chamber establishes a lateral impacting streamflow within an exit chamber portion having lateral parallel boundary layer lock-on walls. Control ports are connected to the opposite sides of the lateral flow chamber and are interconnected by a circulation passageway having a central fluid pulse input port. Output ports are provided to opposite sides of the lateral flow passageway means. Reference ports are connected to the interaction chamber to the opposite sides of the exit chamber. Reference ports are also connected to the circulation passageway.

3,598,136

FLUIDIC INFRARED SENSING DEVICE

Ralph G. Zaginailoff, Beverly, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed Mar. 17, 1969, Ser. No. 807,888
Int. Cl. F15c *1/14*; G01j *5/38*
U.S. Cl. 137—81.5 **9 Claims**

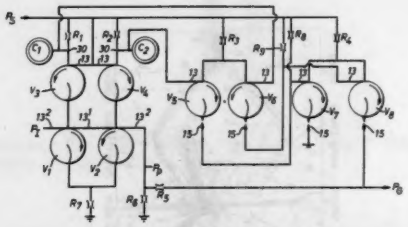


The disclosure illustrates a fluidic infrared sensor comprising a thermally conductive, laminar flow element exposed to infrared energy and series connected with a control jet of a proportional fluidic amplifier. The laminar flow element is heated, thereby varying the flow of the control jet and the deflection of the amplifier's power stream to produce a pressure output proportional to the level of infrared energy. In order to maximize the amplifier output due to very low levels of infrared energy, the laminar flow element is positioned in a thermal insulating chamber having a reflective inner surface. An opening in line with the focus point of a reflective parabolic mirror permits concentrated infrared energy to be applied to the fluidic device positioned in line with the opening. An alternate laminar flow element for this application senses the direction from which the infrared source originates.

3,598,137
FLUIDIC AMPLIFIER

Stanley George Glaze, Brierley Hill, England, assignor to H. M. Hobson, Limited, London, England

Filed Nov. 12, 1969, Ser. No. 875,934
Claims priority, application Great Britain, Nov. 12, 1968, 53601/68
Int. Cl. F15c 1/16
U.S. Cl. 137—81.5 4 Claims

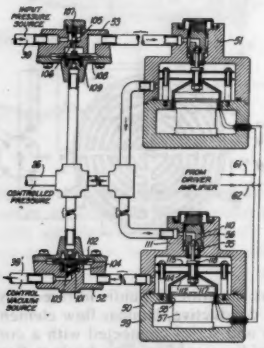


A fluidic amplifier comprising an amplifying section including a pair of probe-type fluidic vortex valves connected in push pull and sharing a common source of supply pressure, a comparing section including a pair of fluidic vortex valves, sharing a common source of supply pressure and connected in push pull with cross-connected control inlets, one having another control inlet subject to an input signal pressure to be multiplied and the other having another control inlet connected to receive a feedback signal from the amplifying section through a tapping from a fluid pressure potentiometer which provides for division of the pressure in said probe by the multiplying factor desired, and means for applying across the control inlets to the valves in the amplifying section the pressure difference established in the supply lines to the valves in the comparing section.

3,598,138
PRESSURE CONTROLLER

Benjamin H. Hadley, 692 W. 9th St., Claremont, Calif.

Filed Mar. 6, 1970, Ser. No. 17,149
Int. Cl. G05d 11/50, 13/00
U.S. Cl. 137—82 14 Claims

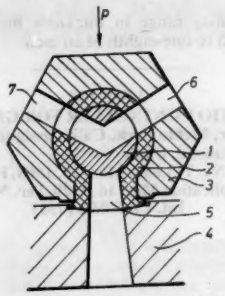


A dynamic pressure controller for generating a pressure at a desired value with high accuracy and stability. A manometer supplying an error signal varying as a function of the difference between a reference pressure and the pressure in the output line. A pair of control valves coupled to the output line, with one valve having a low-pressure source as an input and the other having a high-pressure source as the input, a pressure regulator connected across each of the control valves to maintain substantially constant pressure drop thereacross, and amplifiers for driving both valves as a function of the error signal, with the valves operating in the partially open condition for the zero pressure difference condition, and with the valves having floating poppets actuated magnetically against nonmagnetic seats.

3,598,139
MOLD-CLOSURE COCK FOR MACHINES FOR THE PROCESSING OF HIGHLY REACTIVE MULTICOMPONENT SYSTEMS

Heinrich Boden, Opladen, and Ulrich Knipp, Leverkusen, both of, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 14, 1969, Ser. No. 799,291
Claims priority, application Germany, Feb. 23, 1968, P 16 75 503.6
Int. Cl. F16k 51/00
U.S. Cl. 137—240 10 Claims

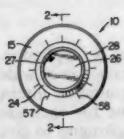


In a mold-closure cock for assembly for machines for processing reactive multicomponent systems, e.g. for foamed plastics, an elastic bushing is provided between the cock body and cock plug which is elastically deformable by application of pressure on the cock body against a mold sprue to facilitate removal of residual reacted plastic particles.

3,598,140
PRESSURE REGULATOR CONSTRUCTION OR THE LIKE

Ned C. Myers, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 13, 1970, Ser. No. 11,215
Int. Cl. F16k 31/145
U.S. Cl. 137—315 20 Claims



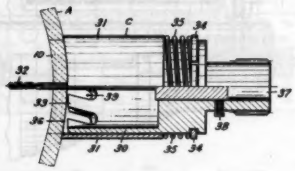
A pressure regulator comprising a cup-shaped housing member carrying a movable valve member for controlling fluid pressure and a rotatable adjusting member snap fittingly carried by the housing member and having a threaded portion provided with an end disposed in aligned relation with the valve member. A spring retainer is threaded to the threaded portion of the adjusting member and is splined to the housing member whereby rotational movement of the adjusting member causes axial movement of the retainer relative to the housing member, the spring retainer having a portion thereof disposed between the end of the adjusting member and the valve member. A compression spring has one end bearing against the valve member to tend to move the same in one direction and has the other end thereof secured to the portion of the spring retainer to be carried thereby.

3,598,141

CUTTER MEANS FOR USE WITH TOOL FOR TAPPING ALREADY LAID WATER-SERVICE PIPES AND THE LIKE WITHOUT INTERRUPTION OF WATER FLOWING THERETHROUGH

Shinkichi Yano, 131-1, Sakurazaka Dori, 7-chome, Toyonaka-shi, Osaka-fu, and Fujio Kawakatu, Osaka-shi, both of, Japan

Filed May 13, 1969, Ser. No. 824,233
Claims priority, application Japan, Aug. 20, 1968, Sept. 2, 1968, Sept. 14, 1968, 43/59694;43/63183;43/79733
Int. Cl. B23b *41/08*
U.S. Cl. 137—318 4 Claims



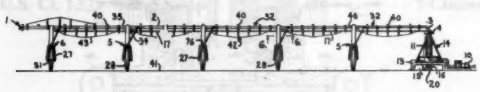
A device wherein a split T-pipe having a water-distributing pipe is joined to an already laid large-diameter water-service pipe at a portion thereof and a cylindrical cutter covered with a cover sleeve is inserted in said water-distributing pipe, thereby boring a required hole in the Water-service pipe at a part thereof, said covering sleeve stopping gaps between tooth edges at the front-end periphery of the cylindrical body to prevent chips from being discharged into the outside through the gaps between said tooth edges. Other advantages and details of the arrangement will be made clear.

3,598,142

SELF-PROPELLED IRRIGATION SYSTEM

Benjamin R. Neier, East Wyatt Earp & Highway 50, Dodge City, Kans.

Filed June 11, 1969, Ser. No. 832,207
Int. Cl. B05b *9/02*; E01h *3/02*
U.S. Cl. 137—344 13 Claims



A self-propelled irrigation system has a plurality of radially spaced intermediate mobile units and an end mobile unit supporting an elongated water-distribution pipe which is connected to a central water-supply pipe. Drive means carried by each intermediate and end mobile unit are operatively connected thereto for moving said distribution pipe around the central supply pipe as an axis. Sleeve joint means are at each intermediate mobile unit permitting controlled transverse movement and radial extension and contraction of the distribution pipe at each of the intermediate mobile units. Control means, carried by each intermediate mobile unit, responsive to relative movement of adjacent mobile units regulate the respective drive means and the travel speed of the respective mobile unit. The control means also have a switch carried by each intermediate mobile unit with each switch being operatively connected to a motor to stop said motor from supplying power to the drive means in response to relative movement between adjacent mobile units beyond selected limits.

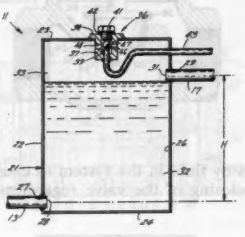
3,598,143

GRAVITY CARBURETOR FEED

Robert E. Mott, 405 Parkwood Ave., Kalamazoo, Mich.

Filed Mar. 12, 1969, Ser. No. 806,443
Int. Cl. F16k *15/04*
U.S. Cl. 137—389 2 Claims

An auxiliary fuel supply device including an auxiliary tank connected remotely or directly to a vehicle carburetor for supplying and maintaining fuel within the carburetor. The auxiliary tank has a discharge line connected to the carburetor and an inlet line connected to the fuel pump, the inlet line opening into the auxiliary tank at an elevation substantially above the elevation of the discharge opening to the carburetor. The opening of the inlet line into the tank is at an elevation above the float valve of the carburetor to permit



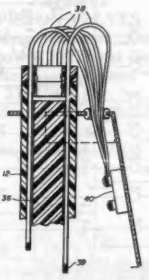
fuel to flow by gravity from the auxiliary tank to the carburetor to compensate for fuel losses within the carburetor, such as by vaporization. The auxiliary fuel tank contains a vent system having a one-way check valve for permitting air at substantially atmospheric pressure to enter the tank to effectively permit fuel to flow from the tank to the carburetor as needed when the vehicle engine and the fuel pump are inoperative.

3,598,144

MULTIPOINT LIQUID LEVEL CONTROLLER

Robert A. Hodgson, 1420 East 37th, Tulsa, Okla.

Filed Dec. 5, 1969, Ser. No. 882,537
Int. Cl. G05d *9/12*
U.S. Cl. 137—392 6 Claims



In a controller for governing the liquid level in a tank, electrical conductors adjustably inserted within the tube of a manometer and the manometer fluid thereof are electrically interconnected to form a single pole sequentially operating electrical switch which controls the energization of a pump or other means to control the liquid level within a tank.

3,598,145

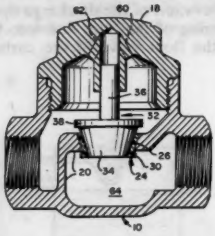
CHECK VALVE

Joseph Wolfson, Rocky Hill, Conn., assignor to Bloomfield Valve Corporation, Bloomfield, Conn.

Continuation-in-part of application Ser. No. 688,113, Dec. 5, 1967, now abandoned. This application June 30, 1969, Ser. No. 837,769
Int. Cl. F16k *15/06*
U.S. Cl. 137—533.21 10 Claims

A check valve having a valve seat which may be readily replaced, said seat being comprised of a high-temperature plastic material. Cooperating with the seat is a disc member

which also is comprised of a high-temperature plastic material, the disc member being characterized by a sail which will



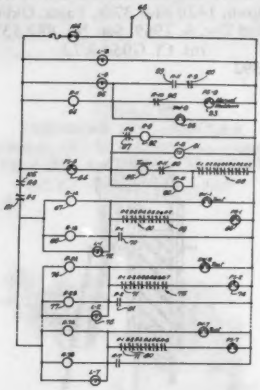
be acted upon by fluid in the system to cause rapid and full opening and closing of the valve regardless of the position thereof.

3,598,146

ELECTRICAL FIRST-OUT INDICATOR SYSTEM FOR USE WITH PNEUMATIC CONTROLS ON A PETROLEUM PROCESS

Allen M. Robin, Anaheim, and Dale R. Jesse, Hacienda Heights, both of, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,762
Int. Cl. F16k *37/00*; H04q *3/02*
U.S. Cl. 137—552 **6 Claims**



An electrical indicator system is connected to a petroleum process where pneumatic controls are employed and where automatic shutdown will take place if any one of a plurality of parameters exceeds predetermined limits. The electrical system uses relays that are actuated by the pneumatic controls which indicate when a parameter goes outside limits. Each such relay has interlocking contacts with the circuits for all the other relays, so that the first actuated relay will lock out the remaining relays. This provides an indication of which condition was first outside limits.

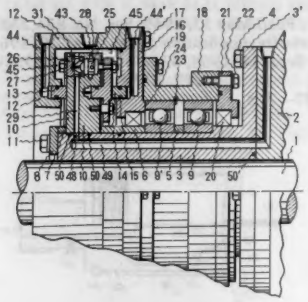
3,598,147

MECHANISMS FOR FEEDING AIR INTO A ROTARY MEMBER

Tadao Kosaka, Ichikawa, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha

Filed Feb. 24, 1970, Ser. No. 13,304
Int. Cl. F16L *39/04*
U.S. Cl. 137—580 **4 Claims**

A mechanism for feeding compressed air from a stationary air line to a rotating, air-operated clutch has a disc mounted on the rotating clutch body and partly enclosed in an annular chamber in a casing open toward the axis of rotation. The casing is freely rotatably mounted on the rotating member and stationary. Annular, circular grooves in axially opposite walls of the chamber receive sealing rings which may be



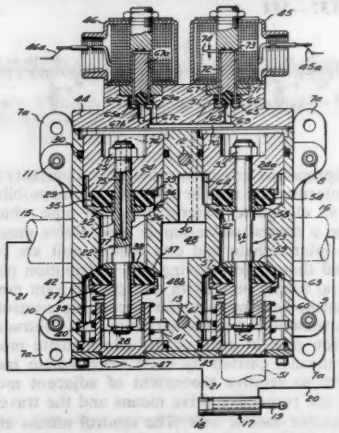
forced outward of the grooves into engagement with the disc by compressed air fed to the grooves. A duct in the disc connects the chamber with the hollow interior of the clutch body and is controlled by a valve which is opened when one of the sealing rings is forced out of the associated groove.

3,598,148

MOMENTARY CONTACT POPPET VALVE

Kenneth K. Kroffke, Cleveland, Ohio, assignor to Airmatic Valve Inc.

Filed Aug. 14, 1969, Ser. No. 850,207
Int. Cl. F15b *21/08*
U.S. Cl. 137—596.16 **7 Claims**



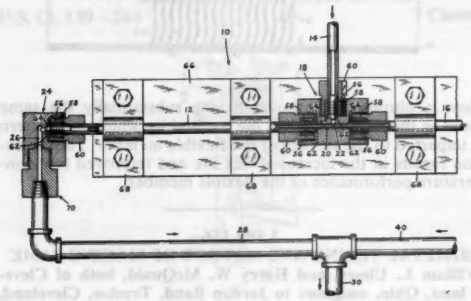
A poppet valve having a poppet assembly mounted for reciprocation to two positions in the valve body. A first position opening one poppet to establish fluid pressure flow from a valve inlet to a valve outlet. A second position closing said one poppet and opening another poppet to establish flow from a valve inlet to a valve outlet. A first solenoid-operated pilot valve momentarily operated to move the poppet assembly from said first position to said second position. A second solenoid-operated pilot valve momentarily operated to restore said assembly to said first position whereby fluid pressure flow is maintained from an inlet to an outlet without the maintenance of current flow in either solenoid.

3,598,149

HIGH-PRESSURE METERING VALVE

Donald E. Witkin, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Aug. 4, 1969, Ser. No. 847,168
Int. Cl. F15d 1/00
U.S. Cl. 137—599 6 Claims



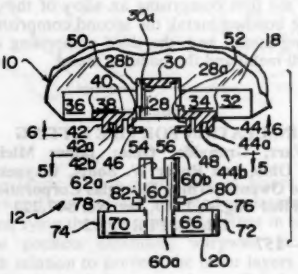
A high-pressure, restriction-flow-metering valve in which a control rod is longitudinally inserted in a hollow cylinder of slightly larger internal diameter having exhaust ports at either end and a high-pressure input port intermediate the cylinder ends.

3,598,150

MEDICAL-SURGICAL VALVE ARRANGEMENT

John L. Nolan, Glenview, Ill., assignor to Hollister Incorporated

Filed June 16, 1969, Ser. No. 833,450
Int. Cl. F16k 5/04
U.S. Cl. 137—625.32 7 Claims



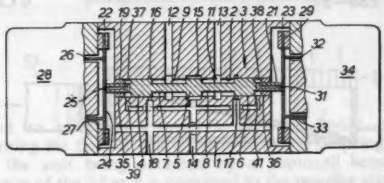
A valve arrangement for a medical-surgical conduit means including first and second valve members, one of which has a female valve sleeve with ports therein and the other of which has a matingly received male valve sleeve with ports therein. Each of the valve members has mutually opposing faces with mutually engageable locking means on the faces for preventing relative rotation of the members and axial dislodgement thereof. The ports of the male member are arranged so that when the members are locked in and assembled condition the ports are either in communication or out of communication with the female ports depending upon the mode of intended use of the valve arrangement.

3,598,151

ELECTROHYDRAULIC VALVE SYSTEMS

Anthony George Lithgow Shore, Winchcombe, England, assignor to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England

Filed June 23, 1969, Ser. No. 835,683
Claims priority, application Great Britain, June 26, 1968, 30405/68
Int. Cl. F16k 11/07
U.S. Cl. 137—625.61 3 Claims



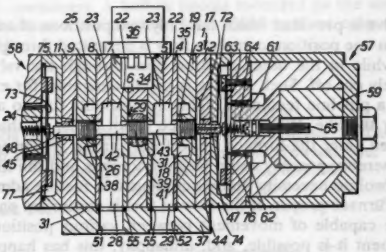
An electrically operated pressure-reducing valve system comprising a moving coil unit mounted for movement within a magnetic field and carrying an obturator and a nozzle carrying fluid at pressure cooperating the obturator so that the movement of the moving coil unit will determine the escape flow of fluid from the nozzle. The nozzle is supplied with fluid at pressure through a restrictor and the junction of the nozzle and the restrictor may supply reduced pressure to a working space for servo adjustment of a servo valve. The moving coil unit includes at least a pair of windings which are connected individually into two electric supply circuits so that the currents in the two circuits may be varied. The variation of the currents in the two circuits may be differential to obtain a desired control effect or alternatively one circuit may be a duplicate of the other circuit and may be switched into operation when the said other circuit fails.

3,598,152

PISTON VALVES

Thomas Desmond Hudson Andrews, Leckhampton Hill, England, assignor to Dowty Technical Developments Limited, Brockhampton, Cheltenham, England

Filed June 23, 1969, Ser. No. 835,686
Claims priority, application Great Britain, June 26, 1968, 30402/68
Int. Cl. F16k 31/06
U.S. Cl. 137—625.61 4 Claims



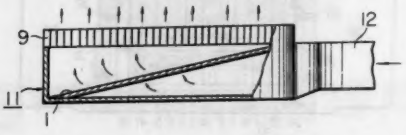
A piston valve having a body formed of a plurality of metal sheets secured together in surface to surface relation by brazing to form a block, the bore and the ports for the piston valve being formed as holes and recesses in the sheets before brazing whereby a minimum of machining operations are necessary after the brazing has been effected. The surface dimensions of the sheets before brazing are each not substantially less than the axial length of the bore through the finished block whereby the block is of substantial strength to resist distortion which might be applied to it during use.

3,598,153

MASS FLOW RATE EQUALIZER USABLE FOR EXHAUST OR SUPPLY OPENINGS OF A DUCT

Taro Hayashi, Osaka-shi, and Aritsune Moriyama, Nishinomiya-shi, both of, Japan, assignors to Sanko Air Plant Ltd., Osaka, Japan

Filed July 28, 1969, Ser. No. 845,189
Claims priority, application Japan, Dec. 2, 1968, Dec. 2, 1968, May 27, 1968, May 27, 1969, 43 88174;43 105062;44 41166;44 41167
Int. Cl. F15d 1/02
U.S. Cl. 138—37 6 Claims



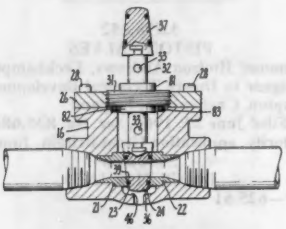
An improved mass flow rate equalizer disposed in a vicinity of opening terminals of a flow duct with inclination against flow direction and having one or more flow passable cutoffs whose flow passable effective area decreases gradually along the flow direction. The equalizer may favorably be provided with one or more perforations having angles with respect to the flow direction.

3,598,154

LINE BLIND VALVE

Ben W. Brundage, 4390 Piedmont Ave., Oakland, Calif.

Continuation of application Ser. No. 796,407, Feb. 4, 1969, now abandoned. This application July 15, 1969, Ser. No. 841,913
Int. Cl. F16l 55/10
U.S. Cl. 138—94.3 1 Claim



A valve is provided which has only two positions of adjustment. In one position, complete flow is permitted through the valve while in the other position flow through the valve is positively cut off. Such a valve is highly desirable, for example, in a pipeline feeding a highly combustible fuel to a furnace or the like. When the furnace is not in use so that the workmen enter the furnace to perform various repair operations thereon, possibly using welding torches and the like, it is an absolute necessity that no combustible fuel be admitted to the furnace proper. If the flow of fuel is controlled only by a valve capable of movement between various positions of adjustment it is possible, and, unhappily, this has happened that any fuel entering the furnace may be ignited with disastrous results.

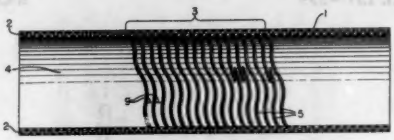
3,598,155

FLEXIBLE MEMBER

Thomas E. Burkley, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Summit, Ohio

Filed Nov. 1, 1967, Ser. No. 679,731
Int. Cl. F16l 11/00
U.S. Cl. 138—119 12 Claims

An improved flexible member of the type designed for use in a fluid pressure system having the predetermined flex wrinkle pattern or a modification thereof imparted to its surface to improve the flexing properties while the member is operating in such system. This pattern may consist of a simulation of the actual flex wrinkle pattern of a previously operating flexible member or be a compromise which employs a plurality of grooves having substantially the same pitch as the wrinkles. Also, the method by which the pattern is imparted to the surface of the flexible member. This invention results in the increased flex life and improved low temperature performance of the flexible member.

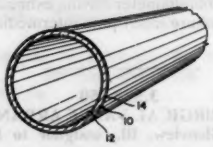


3,598,156

BIMETAL TUBING AND METHOD OF MAKING SAME

William L. Ulmer, and Harry W. McQuaid, both of Cleveland, Ohio, assignors to Jordan Band, Trustee, Cleveland, Ohio

Division of Ser. No. 491,590, Sept. 30, 1965, Pat. No. 3,397,445. This application July 15, 1968, Ser. No. 764,353
Int. Cl. F16l 9/14
U.S. Cl. 138—143 8 Claims



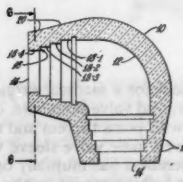
An improved elongated bimetal tubing comprised of a first outer shell and a second inner shell, each formed from different metals, and having therebetween a third bonding metal metallurgically bonded to each. The third metal includes three strata; the first comprising an alloy of the outer shell metal and the bonding metal; the second comprising primarily the bonding metal; and, the third comprising an alloy of the inner shell metal and the bonding metal.

3,598,157

INSULATION FOR PIPE FITTING

Alfred S. Farr, Granville, Ohio; James Michael Long, Pataskala, Ohio, and Roger W. Soltis, Waynesville, N.C., assignors to Owens-Corning Fiberglas Corporation

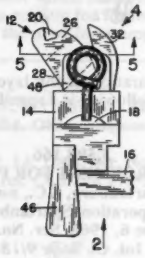
Filed Aug. 4, 1969, Ser. No. 847,221
Int. Cl. F16l 59/02
U.S. Cl. 138—157 19 Claims



Pipe fitting insulation which can be used to insulate fittings of several different pipe sizes. Each piece of insulation has a central cavity large enough to accommodate the largest size fitting intended to be covered, and two openings commu-

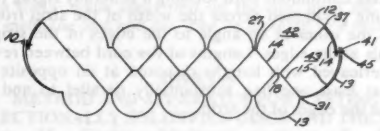
nicating therewith. The openings are of progressively smaller cross section as they proceed outwardly from the central cavity.

3,598,158
YARN CLAMPING AND CUTTING DEVICE
Kenneth J. Hall, Auburn, Mass., assignor to Crompton & Knowles Corporation, Worcester, Mass.
Filed Nov. 10, 1969, Ser. No. 875,156
Int. Cl. D03d *47/36, 45/50*
U.S. Cl. 139—263 **7 Claims**



A yarn clamping and cutting device in which a flat resilient clamping blade abuts a clamping support blade and extends across a groove in the support blade. A combination blade has a cutting edge for cooperating with a cutting blade and a clamping edge for cooperating with the flat clamping blade to clamp a yarn at a point on the clamping blade which extends across the groove.

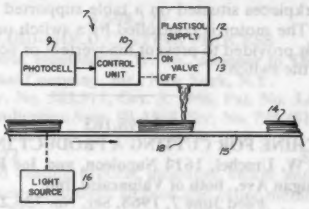
3,598,159
MULTILAYER FABRIC
John A. MacIntyre, Barrington, R.I., assignor to U.S. Plush Mills, Inc.
Filed Sept. 8, 1969, Ser. No. 855,935
Int. Cl. D03d *1/02*
U.S. Cl. 139—384 **2 Claims**



A woven fabric having a plurality of layers, there being outer layers and one or more intermediate layers between the outer layers, tying the outer layers together in such a way as to provide pockets extending warpwise in a generally honeycomb relation to prevent the outer layers from spreading beyond a limited distance when inflated, the opposite edges of the fabric being brought together by one outer layer joining another outer layer opposite it and providing a larger chamber which when inflated will provide a bulge at the opposite edges of the fabric extending lengthwise or warpwise of the fabric.

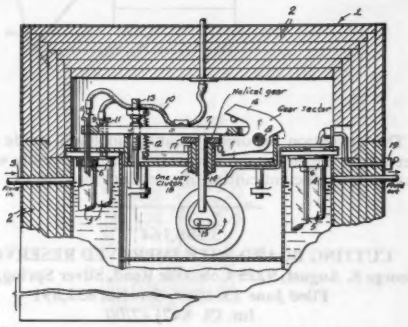
3,598,160
POUR CONTROL SYSTEM
Richard M. Quinn, and Donny W. Candioto, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.
Filed Apr. 30, 1968, Ser. No. 725,347
Int. Cl. B65b *43/42;* **B67c** *3/00*
U.S. Cl. 141—156 **11 Claims**

An electronic unit for accurately timewise controlling the occurrence and duration of a predetermined event—controlling the flow of liquid-state gasket material into a container lid being specifically shown. The unit includes bistable multivibrators and timewise adjustable delay circuits con-



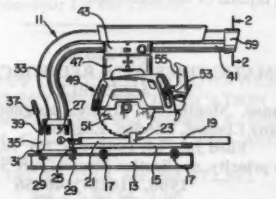
nected to positively control a variable device—a valve governing the flow of gasket material into a lid being shown, with the unit being actuated by a photocell sensing the presence of the lid as it is conveyed to the pouring station.

3,598,161
LAYOUT FRACTION COLLECTOR
William C. Baldwin, Anaheim, Calif.
Filed Apr. 14, 1969, Ser. No. 815,759
Int. Cl. B65b *1/28*
U.S. Cl. 141—284 **8 Claims**



A circular base unit supports a plurality of small containers in a circle about the center. An arm is pivoted on a first pivot to rotate about the center of the base unit and is pivoted about a second pivot to swing up from and down toward the small containers. A hollow needle mounted on the arm vents a container while another feeds fluid to it or extracts fluid from it.

3,598,162
SWITCH INTERLOCK
Francis J. Rosenthal, Jr., Fork, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed June 9, 1969, Ser. No. 831,569
Int. Cl. B27b *5/20*
U.S. Cl. 143—6 A **7 Claims**



The device disclosed herein is a radial arm saw which includes a base frame having an upstanding column pivoted

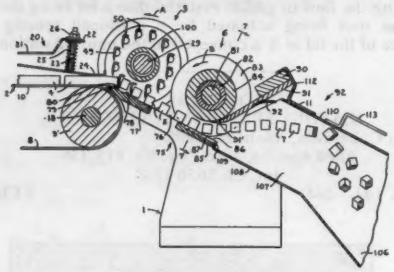
thereon about a generally vertical axis. A radial arm is rigid with the column and has a saw carriage supported thereon for movement longitudinally thereof. An electric motor driven saw is suspended from the carriage and is adapted to cut workpieces situated on a table supported upon the base frame. The motor is controlled by a switch on the arm, and means is provided to prevent inadvertent or accidental actuation of the switch.

3,598,163

MACHINE FOR CUTTING A PRODUCT INTO PIECES

Gerald W. Urschel, 1614 Napoleon, and Joe R. Urschel, 202 Michigan Ave., both of Valparaiso, Ind.

Filed June 7, 1968, Ser. No. 735,235
Int. Cl. A23n *15/00*
U.S. Cl. 146—78 **6 Claims**



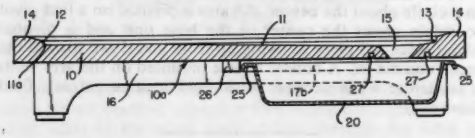
The invention involves locating inclined guide means between a conveyor and a rotatable knife assembly whereby to facilitate efficient cutting of a product into pieces.

3,598,164

CUTTING BOARD WITH IMPROVED RESERVOIR

George S. August, 9225 Colesville Road, Silver Spring, Md.

Filed June 13, 1969, Ser. No. 832,891
Int. Cl. A47j *47/00*
U.S. Cl. 146—215 **8 Claims**



A carving or cutting board is provided with an inclined upper surface, an aperture in said inclined surface, and a relatively large serving receptacle removably attached to the underside of the cutting board below said aperture for accumulating liquids or cut materials.

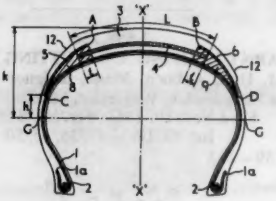
3,598,165

PNEUMATIC TIRES WITH REINFORCED BREAKER ASSEMBLY

Jean Hanus, Montlucon, France, assignor to The Dunlop Company Limited, London, England

Filed July 15, 1968, Ser. No. 745,023
Claims priority, application France, July 31, 1967, Apr. 1, 1968, 116287;146656
Int. Cl. B60c *9/08*
U.S. Cl. 152—361 **13 Claims**

A pneumatic tire comprising a carcass, a breaker assembly, and a reinforcement layer disposed in each shoulder region of the tire in directly overlapping relationship with said carcass and an edge of the breaker assembly such as to reduce



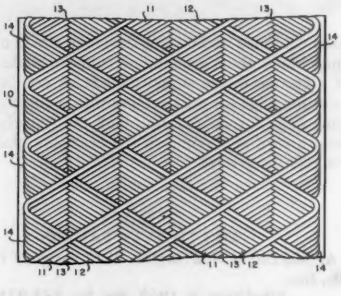
the possibility of separation of the layers of the breaker assembly of which the following is a specification.

3,598,166

ENDLESS REINFORCEMENT FOR PNEUMATIC TIRES

Thomas A. Wells, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed June 6, 1968, Ser. No. 734,919
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 **23 Claims**



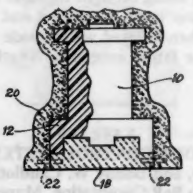
An endless reinforcement strip for a pneumatic tire which comprises continuous cord forming a generally zigzag pattern and being positioned across the width of the strip from one side to the other at an angle to the edges of the strip with reversals at the edges. Lengths of the cord between reversals are interleaved with lengths disposed at an opposite angle along at least one line substantially parallel to and intermediate the edges of the strip.

3,598,167

METHOD AND MEANS FOR THE PRODUCTION OF COLUMNAR-GRAINED CASTINGS

Michael H. Snyderman, Parsippany, N.J., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 1, 1968, Ser. No. 772,754
Int. Cl. B22c *9/00*
U.S. Cl. 164—26 **11 Claims**



A method and materials for producing shell molds for casting columnar grained metal components wherein a pattern is

prepared corresponding to the shape of casting to be formed. The pattern is then combined with a base formed of a material selected from the group consisting of graphite and a refractory of high thermal conductivity. A shell mold is formed around the assembly comprising the pattern and base followed by removal of the pattern material to provide the shell mold. The base operates to conduct heat away from molten metal poured therein at a rate greater than the surrounding mold walls whereby nucleation will begin in the area adjacent the base and columnar grain growth will occur.

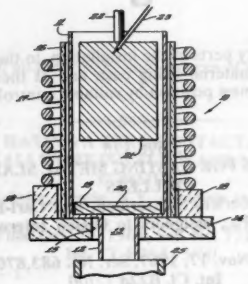
The base included in the assembly of the pattern and base can also be used for connecting supporting rods to lend stability to an arrangement which includes a plurality of the assemblies whereby dip coating for formation of the shell mold can proceed without the need for a supporting baseplate.

3,598,168

TITANIUM CASTING PROCESS

Clyde C. Clark, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 14, 1968, Ser. No. 767,168
Int. Cl. B22d *27/02*
U.S. Cl. 164—51 **4 Claims**



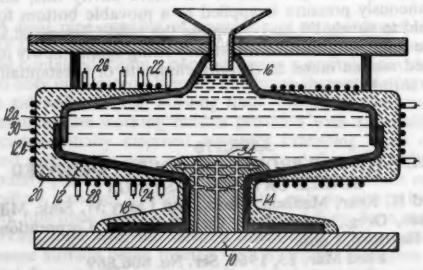
Method and apparatus for casting a titanium alloy which involves suspending a slug of the alloy in spaced relation to the walls of a refractory crucible, inductively heating the slug while so suspended to eventually melt the same, collecting the molten alloy on a disc of titanium alloy positioned in the crucible, and then continuing the application of heat to the molten metal while supported on the disc until the molten metal melts the disc and can then be directed to a mold.

3,598,169

METHOD AND APPARATUS FOR CASTING DIRECTIONALLY SOLIDIFIED DISCS AND THE LIKE

Stephen M. Copley, Madison; Anthony F. Giamei, Middletown; Merton F. Hornbecker, Woodbury, and Bernard H. Kear, Madison, all of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1969, Ser. No. 807,637
Int. Cl. B22d *25/06*
U.S. Cl. 164—60 **14 Claims**



Apparatus and method for inducing radial directional solidification in parts having a relatively large dimension at right angles to the major axis such as discs and the like, in which, for example, a [010] radial and [100] tangential orientation is generated.

3,598,170

FLUID-MOLD CASTING PROCESS

James E. Roberts, Huntington, W. Va., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 583,911, Oct. 3, 1966, Pat. No. 3,444,010.
This application Sept. 19, 1968, Ser. No. 798,481
Int. Cl. B22d *27/00;* **B22c** *3/00*
U.S. Cl. 164—72 **5 Claims**

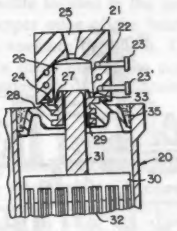
A fluid-mold casting process produces nickel and nickel alloy ingots having improved surface and other metallurgical characteristics using a slag composition containing special amounts of alumina, lime, magnesium oxide, sodium oxide and alkaline earth metal fluoride.

3,598,171

PROCESS FOR BONDING POLE CONNECTIONS AND THE LIKE TO BATTERY POSTS AND THE LIKE

Jurgen Schulz, Berlin, Germany, assignor to Accumulatorenfabrik Sonnenschein G.m.b.H., Budingen am Oberhessen, Germany

Filed Feb. 21, 1968, Ser. No. 707,208
Int. Cl. B22d *19/00*
U.S. Cl. 164—109 **3 Claims**



Metal parts of a storage battery as, for instance, terminal posts, plates, etc. are connected together by inserting them into a mold, and either before or during pouring of molten metal (lead) into the mold, generating a high frequency current in the mold to strip any oxide film from the parts. During pouring this current will create a turbulence in the molten metal to aid in film-stripping. The molten metal fuses to the metal parts. After the mold has been filled it can be cooled to harden the cast bonding metal onto the metal parts that are to be connected. A copper tubular conductor mounted in the mold acts both as an electrical current conductor and as a conveyor for the coolant.

3,598,172

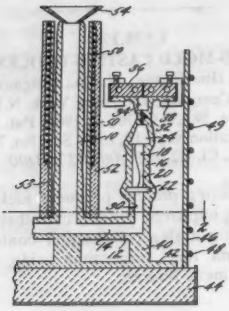
PROCESS OF CASTING WITH DOWNWARD-UNIDIRECTIONAL SOLIDIFICATION

Stephen M. Copley, Madison, and Anthony F. Giamei, New Haven, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 30, 1969, Ser. No. 872,562
Int. Cl. B22d *25/06*
U.S. Cl. 164—127 **4 Claims**

Unidirectionally solidified castings are produced by inverted solidification using a chill plate at the top of the mold

and controlling the temperature gradient to cause solidification to occur from the top downwardly through the mold.

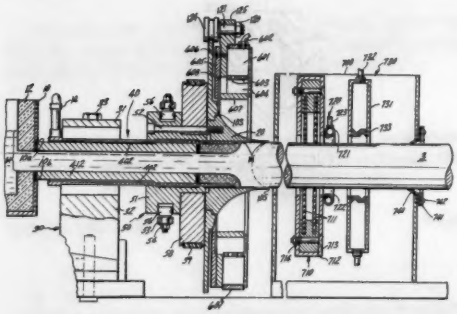


3,598,173

CONTINUOUS CASTING MACHINE HAVING A VARIABLE MOLD LENGTH AND ADAPTED FOR CASTING IN A VARIETY OF SIZES AT HIGH SPEED

James E. Dore, Milford, Conn., and William O. Stauffer, Woodsfield, Ohio, assignors to Olin Mathieson Chemical Corporation

Filed Oct. 17, 1968, Ser. No. 768,354
Int. Cl. B22d *11/10, 11/12*
U.S. Cl. 164—268 59 Claims



A continuous casting machine comprising means for holding a body of molten metal, a feed nozzle connected to said means, a mold assembly including a mold rotatable about the feed nozzle, means for moving the mold assembly back and forth upon the feed nozzle, and means for forcing a lubricant through the nozzle to lubricate casting. Means for applying a cooling medium to the mold and means for withdrawing the casting are additionally included.

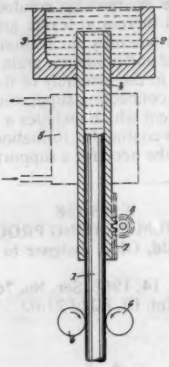
3,598,174

CONTINUOUS CASTING INSTALLATIONS

Rudolf Piesche, Selestat, France, assignor to Etablissements Martel-Catala et Cie, Selestat, France

Filed July 22, 1968, Ser. No. 746,420
Claims priority, application France, July 28, 1967, 116,238
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 4 Claims

The continuous casting installation according to the present invention comprises a tank for receiving the liquid material to be cast communicating with at least one diestock positioned between said tank and extractor means, said diestock being subjected to the effects of cooling means capable of solidifying said material in a zone of the diestock termed the "solidification zone." The diestock is so devised as to be capable of remaining in communication with said tank at the same time as it is shifted longitudinally in relation to other stationary parts of the installation, in the direction of advance of the material being cast, and of then being held immovable in its new position by suitable control means.

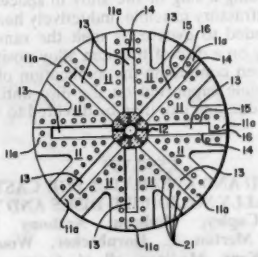


3,598,175

APPARATUS FOR CASTING METAL SLABS AND BILLETS

Erik A. Olsson, Zurich, Switzerland, and Carl-Erik Foogde, Mt. Lebanon, Pa., assignors to Olsson International Inc., Pittsburgh, Pa.

Filed Nov. 17, 1967, Ser. No. 683,870
Int. Cl. B22d *17/00*
U.S. Cl. 164—321 11 Claims



The present invention discloses a mold wherein molten metal is introduced to a riser communicating with the mold so that the level at which the molten metal flows into the mold is progressively raised as the mold cavity fills, and simultaneously pressure is applied to a movable bottom for the mold to slowly lift and compress the solidifying metal so that the solidifying metal is constantly rising against newly introduced molten metal to thereby eliminate or substantially reduce shrinkage defects.

3,598,176

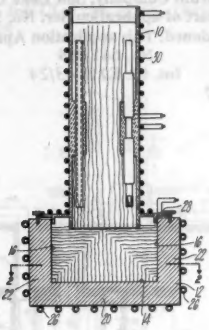
APPARATUS FOR PRODUCING DOUBLY ORIENTED SINGLE CRYSTAL CASTINGS

Bernard H. Kear, Madison, Conn., and Larry W. Sink, Milwaukee, Oreg., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1969, Ser. No. 806,869
Int. Cl. B22d *25/06*
U.S. Cl. 164—353 5 Claims

An apparatus to produce single crystal parts in which the orientation of the dendrite growth in two planes at right an-

gles to one another is described. In effect this produces an



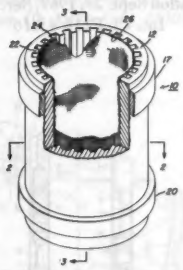
orientation in all three right-angle planes of the cast article.

3,598,177

CONDUIT HAVING A ZERO CONTACT ANGLE WITH AN ALKALI WORKING FLUID AND METHOD OF FORMING

Harold F. Webster, Scotia, N.Y., assignor to General Electric Company

Filed Oct. 29, 1968, Ser. No. 771,426
Int. Cl. F28d *15/00*
U.S. Cl. 165—1 **9 Claims**



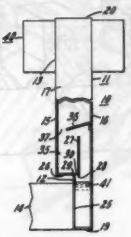
A heat pipe capable of operation at temperatures above 900° C. is described characterized by an alkali metal working fluid contained within a conduit having a crystal face orientation only in selected planes to maximize the wetting between the sidewall and the working fluid. Preferably the conduit containing the working fluid is provided with a plurality of circumferentially disposed inwardly extending teeth overlayed with a thin wire mesh screen to define a plurality of capillary passages for liquid transport and the surface of the capillary passages contains the metal only in planes having work functions below a fixed value, e.g. 4.8 ev. for a sodium working fluid with the desired orientation of the capillary passage surface being formed by a hydrogen reduction of a metal fluoride. The zero contact angle between the working fluid and the conduit permit the initiation of operation of the heat pipe without prior warmup and eliminates localized "hotspots" destructive to the sidewall structure.

3,598,178

HEAT PIPE

Fred W. Staub, Scotia, N.Y., assignor to General Electric Company

Filed May 26, 1969, Ser. No. 827,566
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **6 Claims**



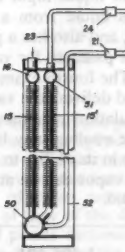
A heat pipe including a sealed container having a pair of opposed sidewalls and a pair of ends, one of the ends being located below the other of the ends. A portion of one sidewall of the container is recessed from the remainder thereof adjacent the aforementioned one end, and is thermally conductive to provide a heat transfer surface inside of the container. A baffle located in the container has an edge spaced from the upper edge of the heat transfer surface to form an elongated aperture therewith. The baffle extends in the direction of the other end of the container and forms a reservoir with the sidewalls of the container.

3,598,179

HEAT EXCHANGER

Louis F. Giauque, 50 Dominion Avenue, Kapuskasing, Ontario, Canada

Filed Sept. 10, 1968, Ser. No. 758,812
Int. Cl. F28b *1/06, 9/08, 9/10*
U.S. Cl. 165—111 **5 Claims**

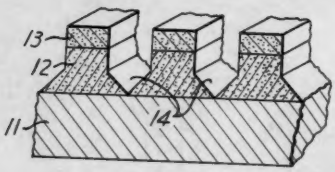


The invention provides a heat exchanger comprising first and second rows of vertically arranged tubes, the outlets of the tubes in each row being connected to separate condensate headers, to which separate traps are connected, and the steam inlets of the second row of tubes being connected to the steam outlets of the first row of tubes whereby the tubes of the first row are automatically purged and air binding is prevented.

3,598,180
HEAT TRANSFER SURFACE STRUCTURE

Robert David Moore, Jr., 817 W. Camino Road, Arcadia, Calif.

Filed July 6, 1970, Ser. No. 52,609
Int. Cl. F28f *13/06*
U.S. Cl. 165—133 28 Claims



A heat transfer surface structure is described wherein both heat and vaporizable liquid are conveyed through a capillary material to a free vaporizing surface of the capillary material where the liquid vaporizes. Heat is conducted from a heat source wall through a portion of the capillary material to the vaporizing surface where it escapes as heat of vaporization along with the vapor. The liquid flows through the pores of the capillary material from a liquid source to the vaporizing surface under the influence of capillary forces. The vaporizing surface is divided into a large number of regions which are close to the heat source wall and are connected by way of vapor passages to a region external to the capillary material. Thus, the heat conducting paths through the capillary material are very short, and vapor can escape freely through relatively large passages rather than having to force its way through the pores of the capillary material where it would interfere with the liquid flow. Such a vented capillary vaporizer is capable of handing much higher heat flux densities than previous capillary vaporizers. Four examples of capillary vaporizer are set forth, two of these for operation where the liquid and vapor are comingled as in a boiler tube or evaporator tube. One of these has separated areas of capillary material in thermal contact with the heat source surface, thereby defining passages therebetween. The other is similar with added portions of porous materials to form a manifold having a hierarchy of vapor passages of decreasing number and increasing cross section, thus increasing the separation between the regions of liquid input and vapor output. The third example accepts liquid from a capillary structure or wick as in a heat pipe, and also has a pair of manifolds in the form of a hierarchy of passages for vapor flow and capillary paths for liquid flow. The fourth example receives bulk liquid through a channel, and delivers the vapor through a separate passage. Thermal insulation maintains the bulk liquid relatively cool, and active cooling may be provided. This latter embodiment is unique in its ability to pump the heat transfer fluid since the output vapor can be at a higher pressure than the incoming bulk liquid.

3,598,181
OIL RECOVERY EMPLOYING VISCOSIFIERS PRODUCED BY THE ACTION OF ANIONIC SURFACTANTS ON BACTERIAL CULTURES

Eugene H. Wegner, and Charles A. Stratton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

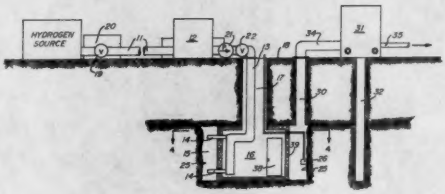
Filed Feb. 17, 1970, Ser. No. 12,119
Int. Cl. E21b *43/22*
U.S. Cl. 166—246 6 Claims

Bacterial cultures are treated with anionic surfactants to form a viscosifier for use in preparing a thickened aqueous medium for employment in the recovery of oil from oil-bearing stratum by waterflood methods.

3,598,182
METHOD AND APPARATUS FOR IN SITU DISTILLATION AND HYDROGENATION OF CARBONACEOUS MATERIALS

Clarence I. Justheim, Salt Lake City, Utah, assignor to Justheim Petroleum Company, Salt Lake City, Utah

Continuation-in-part of application Ser. No. 550,343, May 16, 1966, now abandoned. This application Apr. 25, 1967, Ser. No. 641,089
Int. Cl. E21b *43/24*
U.S. Cl. 166—247 17 Claims

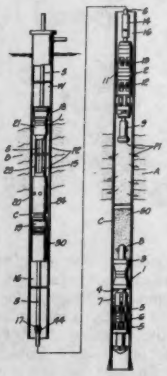


A method of distilling and hydrogenating the hydrocarbon content of carbonaceous materials wherein hot hydrogen is introduced into the carbonaceous material in sufficient quantity and at sufficient temperature to concurrently release and distill the hydrocarbon content. Preferred apparatus for practicing the method includes a source of hydrogen, means for varying the temperature of the hydrogen, an underground cavern in the carbonaceous material, and temperature modulating means at the face of the shale for regulating the temperature temperature of the hydrogen.

3,598,183
METHOD AND APPARATUS FOR TREATING WELLS

Lyle B. Scott, South Gate, Calif., assignor to Byron Jackson, Inc., Long Beach, Calif.

Division of Ser. No. 703,983, Feb. 8, 1968, Pat. No. 3,499,486. This application Sept. 29, 1969, Ser. No. 871,016
Int. Cl. F21b *43/16*
U.S. Cl. 166—305 5 Claims



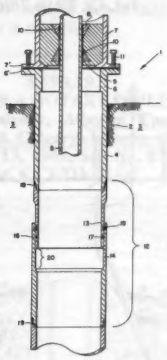
A method of preventing the flow of fluid into a low-pressure zone of earth formation traversed by a well bore when said fluid is placed in the well bore, in which a liner is temporarily employed to block off said low pressure zone. Apparatus for performing such method in which the liner is provided with a bypass valve, opposing packers, and a releasable connection with a running in string of pipe.

3,598,184

METHOD AND APPARATUS FOR PRODUCING A WELL THROUGH A PERMAFROST ZONE

Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,238
Int. Cl. E21b *17/08, 33/04*
U.S. Cl. 166—315 **10 Claims**



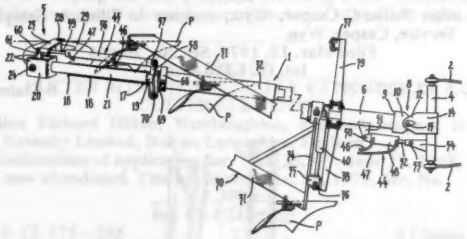
A method and apparatus for producing a well in the earth through a zone of permafrost which is subject to subsidence on thawing, wherein casing is set in the permafrost subsidence zone and then allowed to subside at least one point along the length thereof with the permafrost.

3,598,185

SEMIMOUNTED TURNOVER PLOW HAVING CAM-TILTED AND INDEPENDENTLY HYDRAULICALLY STEERED REAR WHEEL

Clarence B. Richey, Fresno, Calif., assignor to Massey-Ferguson Inc., Des Moines, Iowa

Filed May 9, 1968, Ser. No. 728,021
Int. Cl. A01b *3/44, 69/00*
U.S. Cl. 172—212 **6 Claims**



A semimounted turnover plow having a tail wheel supported on the trailing end of the plow frame in such a manner that the wheel is automatically tilted to an inclined position to counteract side forces acting on the plow bottoms in the plowing position of the plows, and returns to a vertical position when the plows are in a transport position. The wheel is tilted about an inclined axis such that it also changes direction relative to the plow frame as it is tilted.

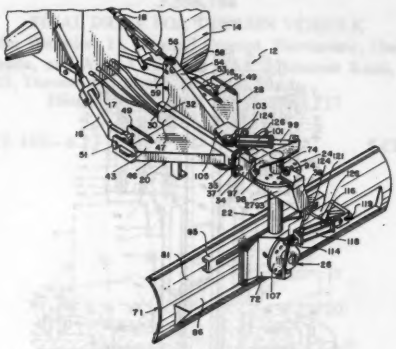
3,598,186

ADJUSTABLE BLADE MEANS

John G. Coontz, P.O. Box 104, Kiowa, Kans.

Filed Mar. 17, 1969, Ser. No. 807,483
Int. Cl. A01b *65/00*
U.S. Cl. 172—666 **3 Claims**

This invention is a blade means readily attachable to a tractor and having a blade structure interconnected to an angle adjustment means and a tilt adjustment means to rotate the blade means about horizontal and vertical axes to achieve the desired angular relationship. More particularly, this invention is a blade means readily raised in a common horizontal plane and actuated by hydraulic means for rotation of a blade member about vertical and horizontal axes.

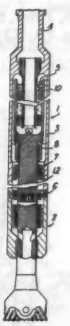


3,598,187

TURBODRILL

Jean Mothre, Le Vesinet, France, assignor to Entreprise De Recherches Et D'Activites Petrolieres (ELF), Paris, France

Filed May 7, 1970, Ser. No. 35,514
Claims priority, application France, May 13, 1969, 69.15506
Int. Cl. E21b *3/12*
U.S. Cl. 173—73 **6 Claims**



A turbodrill in which the hydraulic power unit consists of a rotor which is centered within a cylindrical stator by an axial thrust bearing, the forces exerted on said axial thrust bearing being balanced irrespective of the nature of the formation by virtue of two systems of vanes separated by a baffle for reversing the direction of flow of the driving fluid. Since the entire quantity of fluid passes successively through the two sets of vanes in opposite directions, the axial thrust forces are balanced on the thrust bearing which centers the rotor irrespective of the variations in loss of load on the drilling head.

3,598,188

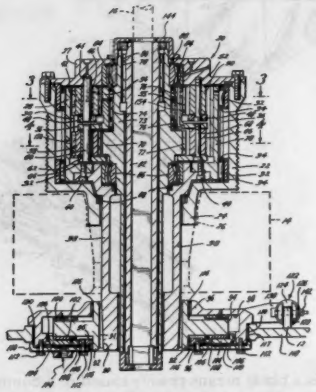
KELLY SPEED BUSHING

James Foster, P.O. Box 1351, Wichita Falls, Tex.

Filed May 22, 1969, Ser. No. 826,885
Int. Cl. F21b *3/04*
U.S. Cl. 173—165 **25 Claims**

An apparatus and method for rotating a kelly and drill string by the rotary of a drilling apparatus at a speed different

than the speed of the rotary. The apparatus generally includes a housing or bushing spaced about the kelly which passes through the table, the housing or bushing being adapted to be received and rotated by the rotary. An anchor ring gear is provided concentrically within the housing and



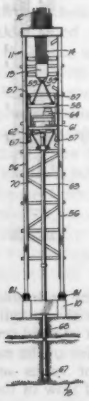
extends therefrom for attachment to the drilling apparatus structure. Epicyclic or planetary gear means couple with the bushing or housing and mesh with the anchor ring gear to transmit rotary motion from the housing to the kelly. Additionally, holding means secure the anchor ring gear to the drilling apparatus structure.

3,598,189

RAISE DRILLING MACHINE

Charles K. Presley, Las Vegas, Nev., and William A. Glass, Oklahoma City, Okla., assignors to Shaft Drillers, Inc., Las Vegas, Nev.

Filed July 3, 1969, Ser. No. 838,903
Int. Cl. E21b *3/02*
U.S. Cl. 175—53 **9 Claims**



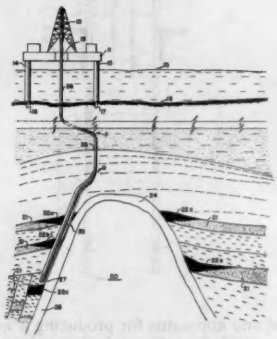
A rotary drilling rig employs a drill string suspended and rotated by a power head guided for longitudinal movement within a mast mounted on a base. A power-driven spooling drum receives a cable which passes between a crown block on the mast and a travelling block supporting the power head. The mast is proportioned to absorb the reaction torque of the power head and to transmit it to the base. A first bit on the lower end of the rotary drill string forms a pilot hole in the earth as the drill string descends by gravity under control of a brake on the spooling drum as it unspools the cable. The pilot hole intersects a shaft in the earth, where a larger bit is installed on the lower of the drill string, to cut upwardly. Torque is then applied to the drum to turn it at a speed between a stalled condition and very low r.p.m. to keep a tension on the cable, thereby applying a lifting force to the rotary drill string and larger bit to enlarge the pilot hole from the bottom up.

3,598,190

SALT DOME DRILLING METHOD

Donald J. Pfau, Metairie, La., assignor to Shell Oil Company, New York, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,225
Int. Cl. E21b *7/06*
U.S. Cl. 175—61 **6 Claims**



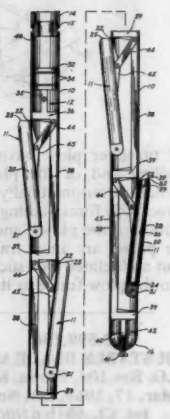
A method of drilling or testing for potential hydrocarbon-producing zones adjacent a salt dome, shale dome, fault plane, or other geologic surface or features including the steps of drilling vertically, deviating the direction of drilling to a slant from vertical, drilling at said slant to a predetermined position above the geological surface where the hole is returned to vertical (or near vertical), and then deviated to a slant approximately paralleling the geologic surface in order to penetrate a maximum number of potential objectives at optimum positions.

3,598,191

MULTIPLE UNIT WELL BORE SIDEWALL SAMPLER TOOL

Luther Bullard, Casper, Wyo., assignor to Slimhole Sample Service, Casper, Wyo.

Filed Mar. 18, 1970, Ser. No. 20,655
Int. Cl. E21b *49/02*
U.S. Cl. 175—77 **8 Claims**



A well bore sidewall-sampling tool comprises a casing, adapted to be secured to the end of a drill pipe, and contain-

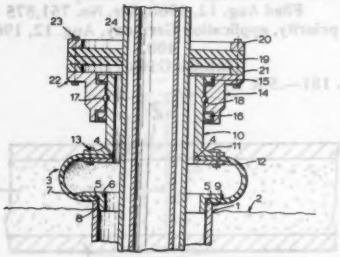
ing a plurality of sample core cutter heads, each of which encases a clear plastic disposable liner tube for receiving and protecting a collected sample of the well bore wall. An actuating mechanism within the casing is operated by fluid pressure applied through the drill pipe. This mechanism includes a rigid operating bar connected to each head for moving each cutter head outwardly into sampling engagement with the sidewall of the well bore when fluid pressure is applied to the casing. The drill pipe is then lifted to cause the heads to bite into the sidewall and cut a sample. A compression spring retracts the sample heads into the casing when the sampling operation is completed.

3,598,192

CASING SEAL FOR A ROTARY DRILL APPARATUS

Floyd W. Becker, Calgary, Alberta, Canada, assignor to Becker Drills Limited, Calgary, Alberta, Canada

Filed Nov. 13, 1969, Ser. No. 876,417
Int. Cl. E21b *21/00*
U.S. Cl. 175—210 **6 Claims**



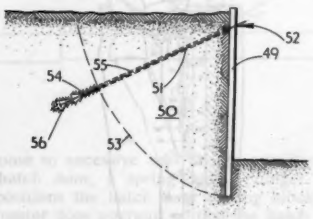
An apparatus for sealing a rotary drill to an encased hole which consists of an annular resilient member secured to the hole casing and a cylindrical body mounted above the resilient member. A rotatable housing is mounted on the cylindrical body which has a flexible annular member coaxial therewith. A channel is provided through the casing, resilient member, cylindrical body and rotatable housing for the passage of a drill pipe. The flexible annular member is capable of clasping the drill pipe and providing a seal therewith while the rotatable housing permits rotation of the drill pipe.

3,598,193

CUTTER BITS WITH RADIALLY EXTENDABLE CUTTER ELEMENTS

Allan Richard Hilton, Westhoughton, England, assignor to Navenby Limited, Bolton, Lancashire, England

Continuation of application Ser. No. 736,371, June 12, 1968, now abandoned. This application Jan. 29, 1970, Ser. No. 7,389
Int. Cl. E21b *9/26*
U.S. Cl. 175—285 **6 Claims**



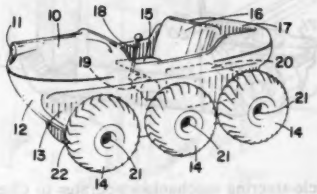
A cutter for enlarging a hole in clay, soil, rock or the like comprising a use means which can be moved from an out of use position to allow removal from the hole or to an in use position in which rotation of the cutter causes undercutting or enlargement of the hole.

3,598,194

FINAL DRIVE FOR TERRAIN VEHICLE

Joachim Wappler, 11 Clayhall Cresent, Downsview, Ontario, Canada, and Arno C. Schwarz, 55 Oakmount Road, Apt. 1503, Toronto 5, Ontario, both of, Canada

Filed June 10, 1968, Ser. No. 746,717
Int. Cl. B62d *11/06*
U.S. Cl. 180—6.2 **5 Claims**



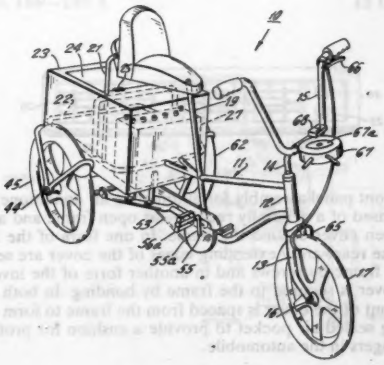
A side drive train system for motor driven vehicles with wheels having a belt and pulley system associated with the axles of the wheels for rotating the same where one axle is driven directly or indirectly from the side drive train system.

3,598,195

ELECTRIC TRICYCLE

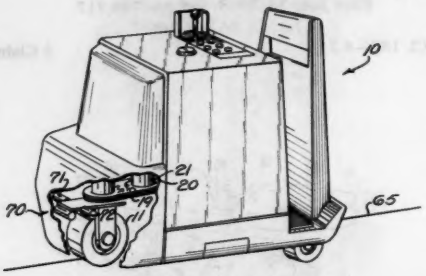
Phillip Steller, Great Neck, N.Y., assignor to Stelber Industries, Inc., Elmhurst, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,499
Int. Cl. B60l *11/18*; B62k *11/00*
U.S. Cl. 180—27 **4 Claims**



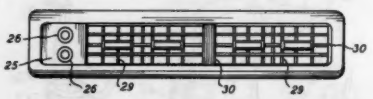
A tricycle is provided with a battery-powered drive motor as well as pedal-operated drive means so connected that either of the drive means may be used alone or may be used in combination to supplement each other. Both drive means supply power to the rear axle and the rear wheels are mounted so as to rotate at different speeds when the tricycle is being turned.

3,598,196
STEERING MECHANISM
Thomas J. Baiiantyne, Jenkintown, and Bernard W. Jalbert, Fallsington, both of, Pa., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed May 23, 1969, Ser. No. 827,383
Int. Cl. B62d *5/04*
U.S. Cl. 180—79.1 **13 Claims**



A vehicle-steering mechanism operates to cause a vehicle to follow a current-carrying wire. The steering mechanism includes a driven member and a pair of electromagnetic clutches having output members drivingly connected with the driven member for applying oppositely directed driving forces thereto. These driving forces are substantially equal when the vehicle is properly positioned relative to the current-carrying wire. Sensor means senses deviation of the vehicle from the wire and through a control circuit operates to control the clutches to change the driving torque applied to the driven member. As a result, the driven member is rotated to effect movement of a wheel for vehicle steering purposes.

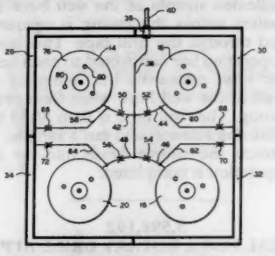
3,598,197
ABSORBENT BEZEL FOR AIR CONDITIONER
Roy M. Neece, Forth Worth, Tex., assignor to Dynaplastics, Inc., Fort Worth, Tex.
Filed June 11, 1969, Ser. No. 832,356
Int. Cl. B60r *21/04*
U.S. Cl. 180—90 **4 Claims**



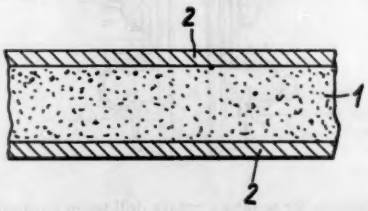
A front panel assembly for automobile air conditioners and comprised of a generally rectangular open frame and a flexible open cover around the frame. In one form of the invention the rearwardly extending edges of the cover are secured to the frame by screws and in another form of the invention the cover is secured to the frame by bonding. In both forms the front of the cover is spaced from the frame to form a projecting sealed air pocket to provide a cushion for protecting passengers in the automobile.

3,598,198
MATERIAL HANDLING DEVICE WITH INFLATABLE AIR PADS
Elgin S. Williams, Athens, Mich., assignor to Clark Equipment Company
Filed Jan. 12, 1970, Ser. No. 2,214
Int. Cl. B60n *1/00*
U.S. Cl. 180—121 **4 Claims**

An air film pallet with a plurality of inflatable air pads connectable to a source of pressurized air through separate sonic flow restrictors. Each pad is connected to a separate air chamber through a separate flow restrictor located downstream of the associated sonic flow restrictor so that vertical oscillation is prevented.

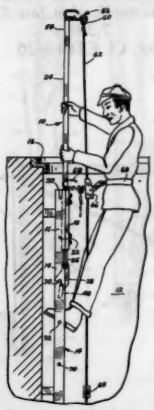


3,598,199
REFLECTOR AND METHOD OF MAKING SAME
Peter Mertens, and Ernst August Winkelholz, both of Bremen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Aug. 12, 1968, Ser. No. 751,875
Claims priority, application Germany, Aug. 12, 1967, P 15 72 400.2
Int. Cl. G10k *11/00*
U.S. Cl. 181—.5 R **3 Claims**



Article for reflecting sound waves in water in which polyurethane foam is watertightly embedded in an outer casing formed of polyurethane casting resin embedding it in a casing of polyurethane casting resin. Method for producing such an article including heating the polyurethane foam to about 120° C.

3,598,200
EXTENSIBLE SAFETY APPLIANCE FOR MANHOLE LADDERS
Harvey L. Thompson, Red Wing, Minn., assignor to Meyer Manufacturing, Inc., Red Wing, Minn.
Filed July 9, 1970, Ser. No. 53,523
Int. Cl. A62b *1/16;* **E06c** *7/18*
U.S. Cl. 182—8 **8 Claims**



A sleeve attached to the rungs of a manhole ladder has a slidable rod therein which is extendable upward from the

manhole to provide a vertical railing for workman on the ladder. A support at the lower end of the rod releasably engages a ladder rung to retain the rod in extended position; when unneeded the rod can be stored wholly within the manhole.

The purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers, or practitioners in the art who are not familiar with patent or legal terms of phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,598,201

CLIMBING DEVICE

James A. Thurmond, 1305 Honeywood Drive, Crestwood, Mo.

Filed May 21, 1969, Ser. No. 826,423
Int. Cl. E06c *7/08*
U.S. Cl. 182—92 **2 Claims**

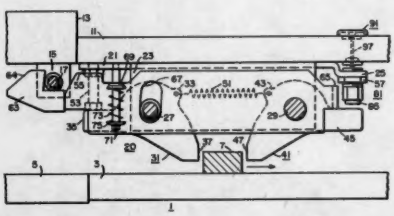
An L-shaped step is releasably securable to a tree, by a flexible band, to facilitate the climbing of that tree.

3,598,202

ELEVATOR DOOR CONTROL

Andrew F. Kirsch, Edison, and William M. Ostrander, Hackensack, both of, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1968, Ser. No. 787,979
Int. Cl. B66b *1/00*
U.S. Cl. 187—48 **18 Claims**



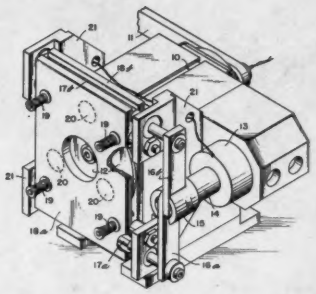
In response to excessive heat on the corridor side of an elevator hatch door, a spring-loaded plunger is released which repositions the hatch door driving block associated with the master door operator so that the hatch door is not automatically unlocked and opened by the vane carried on the car door when the car door is opened adjacent the associated landing. The hatch door can still be opened manually by an occupant of the car who releases the locking mechanism by rotating the driving block against the force exerted by the plunger.

3,598,203

SPRING APPLIED, ELECTRIC RELEASED BRAKE

Earl J. Donaldson, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 3, 1969, Ser. No. 803,765
Int. Cl. B60t *13/04*
U.S. Cl. 188—171 **1 Claim**



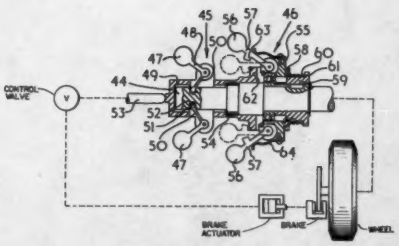
A rotary motion brake comprising two spring-loaded parallel plates which are separated by means of a cam capable of turning to permit the plates to come together to cage a disc placed therebetween. The operation of the cam is controlled by solenoid means.

3,598,204

VEHICLE ANTISKID BRAKING SYSTEMS

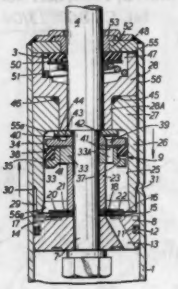
John Walter Davis, Coventry, England, assignor to The Dunlop Company Limited, Birmingham, England

Filed Oct. 25, 1968, Ser. No. 770,739
Claims priority, application Great Britain, Oct. 31, 1967, 49342/67
Int. Cl. B60t *8/16*
U.S. Cl. 188—181 A **15 Claims**



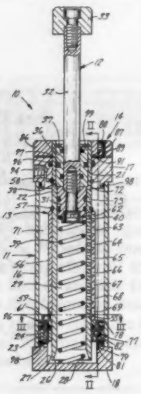
A skid-sensing means comprising a first governor positively driven by a shaft and arranged to collapse and displace a valve member when its rate of rotation falls below a predetermined value and a second governor frictionally driven by the shaft and arranged to collapse and prevent displacement of the valve member when its rate of rotation falls below a predetermined value, of which the following is a specification.

3,598,205
SHOCK ABSORBER INCLUDING PLURAL CONTROL MEANS
Dennis Kenyon, Mirfield, England, assignor to Woodhead Manufacturing Company Limited, Yorkshire, England
Filed Mar. 24, 1969, Ser. No. 809,516
Claims priority, application Great Britain, Apr. 1, 1968, 15543/68
Int. Cl. F16f 9/48
U.S. Cl. 188—284 **1 Claim**



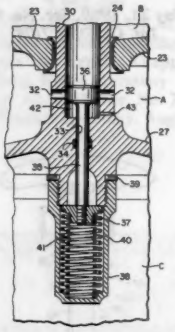
A shock absorber which comprises a working cylinder, a piston arranged to slide in the cylinder and main fluid control means controlling flow of fluid from one side of the piston to the other. Subsidiary fluid control means are provided which are arranged to impose a threshold resistance to movement of the piston with respect to the cylinder in at least one direction, and to reduce or eliminate the threshold resistance after an initial movement of the piston with respect to the cylinder.

3,598,206
ADJUSTABLE SHOCK ABSORBERS
Ransom J. Hennells, Plymouth, Mich., assignor to W. E. Hennells Company, Inc., Plymouth, Mich.
Filed Mar. 24, 1969, Ser. No. 809,637
Int. Cl. F16f 9/44
U.S. Cl. 188—287 **8 Claims**



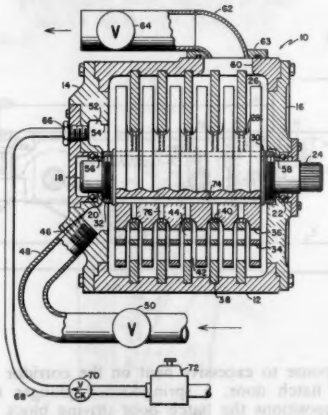
An adjustable energy absorber including a housing having a ram slideably extending therefrom. The housing includes a first control sleeve which divides the housing into a pair of fluid chambers, the sleeve having an axially extending row of openings providing communication between the two chambers. A further control sleeve surrounds the first sleeve and also contains a substantially axially extending row of openings therethrough, one of the rows of openings being slightly angularly inclined relative to the other row. One of the control sleeves is rotatable to adjust the relative angular position between the control sleeves to vary the area of overlap between the two rows of openings. Imposition of a force on the ram causes the ram to force fluid from one chamber through the openings into the other chamber, the ram sequentially covering the openings as it moves axially of the housing. The amount of energy absorbed can be controlled by varying the overlap area of the two rows of openings.

3,598,207
DUAL MODE SHOCK STRUT
Erwin Horst Hartel, Brunswick, Ohio, assignor to Penumo Dynamics Corporation, Cleveland, Ohio
Filed Jan. 28, 1969, Ser. No. 794,681
Int. Cl. F16f 9/342
U.S. Cl. 188—289 **9 Claims**



Increase in static internal pressure in the strut after landing of the aircraft opens a bypass valve paralleling the standard flow area to provide a softer vertical load response for taxiing.

3,598,208
LIQUID BRAKE DYNAMOMETER
Joachim C. Bronder, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed June 25, 1969, Ser. No. 836,411
Int. Cl. F16d 57/02
U.S. Cl. 188—290 **2 Claims**



The disclosure illustrates a liquid brake dynamometer having a rotor comprising a series of spaced perforated disks

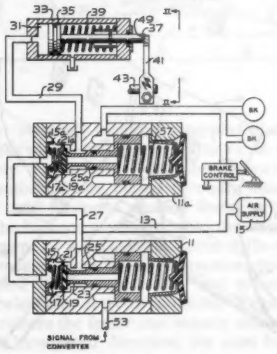
journaled in a chamber. Water is passed through the chamber at a given rate set by flow control valves so that the resistance to rotation of the rotor is primarily a function of the water flow. Air at a predetermined pressure level is injected into the housing to eliminate cavitation. The pressure of the injected air is adjustable to provide a vernier effect on the dynamometer's power absorption.

3,598,209

DOWNSHIFT PREVENTION DEVICE WITH BRAKE OR CONVERTOR OVERRIDE

Shairyl I. Pearce, Tazewell, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 16, 1968, Ser. No. 784,119
Int. Cl. F16h *57/10*
U.S. Cl. 192—4 A **10 Claims**



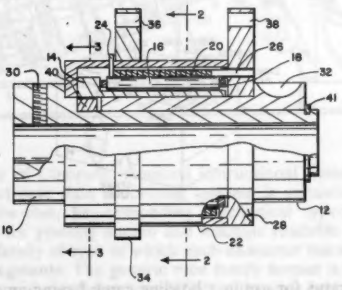
A system for the prevention of a downshift of a transmission in a direct or overdrive mode wherein a pneumatically actuated pin, acting upon a cam, prevents the shifting of a transmission to a lower gear. When a directional valve is actuated by a signal responsive to the transmission being in the torque converter mode, the pin is biased away from the cam allowing such a downshift. When the operator must stop the vehicle at all costs to insure his own safety, a directional valve is actuated by the brake system so as to release the pin, allowing the transmission to be downshifted.

3,598,210

CLUTCH COMPRISING A HELICAL SPRING ACTUATOR

William H. Barr, 51 Liberty Pole Road, Hingham, Mass.

Filed Mar. 10, 1969, Ser. No. 805,550
Int. Cl. F16d *13/12, 13/20*
U.S. Cl. 192—38 **14 Claims**



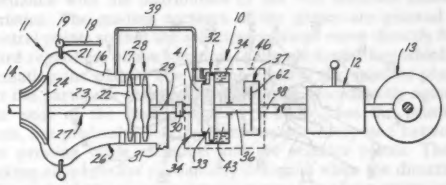
A friction clutch or brake having a cylindrical drum within a close fitting tubular collet, a set of rollers surrounding the collet, a helical spring circumscribing the rollers and means for circumferentially tightening the spring. When the spring is tightened it acts radially on the rollers which in turn compress the collet into frictional engagement with the drum, thereby transmitting torque between the collet and the drum. The transmitted torque will gradually increase as the rollers rotate after the spring is tightened, permitting clutching of heavy inertia loads without heavy torsional impact. Various functional and structural modifications employing this principle are also disclosed.

3,598,211

SPEED-RESPONSIVE CLUTCH

Donald J. Fergle, St. Clair Shores, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Sept. 30, 1968, Ser. No. 763,669
Int. Cl. F16d *43/00*
U.S. Cl. 192—.032 **16 Claims**



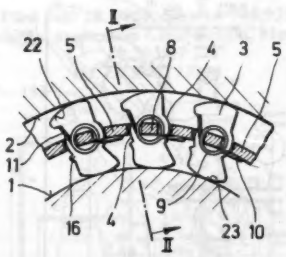
A torque-adjusting system for an engine-to-load, ratio-shiftable power train, wherein either the engine or the load has a sufficiently high speed or high inertia as to cause a shock in the power train upon effecting a ratio shift therein, said torque-adjusting system including a variable capacity clutch connected in the power train having (a) reactive means sensitive to the torque delivered by the engine and capable of regulating the torque output capacity of said variable capacity clutch as a function of the engine torque together with (b) means effecting a further regulating of said torque output capacity as a function of the speed of rotation of said output shaft of said engine.

3,598,212

RETAINER RING FOR A FREEWHEEL CLUTCH

Emil Giese, Bad Homburg vor der Hohe, Germany, assignor to Ringspann Albrecht Maurer K.G., Bad Homburg vor der Hohe, Germany

Filed Jan. 12, 1970, Ser. No. 2,321
Claims priority, application Germany, Mar. 27, 1969, P 19 15 567.0
Int. Cl. F16d *41/07*
U.S. Cl. 192—45.1 **8 Claims**



A retainer ring for insertion between the coaxially arranged driving member and the driven member of a freewheel clutch comprises a central ring portion having elongated holes wherein tiltable sprags are disposed, and two ring portions extending in radial direction from the central ring portion to the convex-cylindrical bearing surface of the

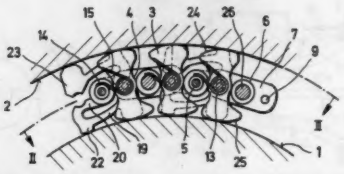
inner clutch member and to the concave-cylindrical bearing surface of the outer clutch member. The retainer ring is of Z-, H- or U-shaped cross section and the sprags are supported in the holes of the central ring portion by helical springs mounted on lugs projecting to the inside of the holes. One spring end is bent over for engaging the sprag in a groove, thereby securing it against displacement in radial clutch direction.

3,598,213

METAL RETAINER RING FOR FREEWHEEL CLUTCH

Emil Giese; Ruprecht Maurer, and Albrecht Maurer, all of Bad Homburg, vor der Hohe, Germany, assignors to Ringspann Albrecht Maurer K.G., Bad Homburg vor der Hohe, Germany

Filed Jan. 12, 1970, Ser. No. 2,323
Claims priority, application Germany, Mar. 25, 1969, P 19 15 099.3
Int. Cl. F16d *41/07*
U.S. Cl. 192—45.1 **12 Claims**



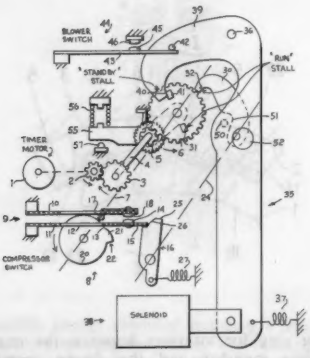
A retainer ring for freewheel clutches is assembled from metal ring links which are pivotably connected to one another and support tiltable sprags between them. The links comprise flanges arranged in pairs opposite to one another and connected by bolts. Studs project from the flanges to the inner side of each link, and the sprags are tiltably mounted between the studs. Two different embodiments of such retainer rings are disclosed. In one embodiment first-type links, on which the tiltable sprags are mounted, are arranged in alternating order with second-type links not provided with sprags. In a second embodiment ring links of one type only are used which hold the sprags between studs on one side of the bolt while they are hinged with the other side on the studs of the adjacent link.

3,598,214

CONDITION CONTROL DEVICE AND SYSTEM

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Aug. 14, 1969, Ser. No. 849,961
Int. Cl. F16d *71/00*; H01h *7/00, 43/10*
U.S. Cl. 192—148 **11 Claims**



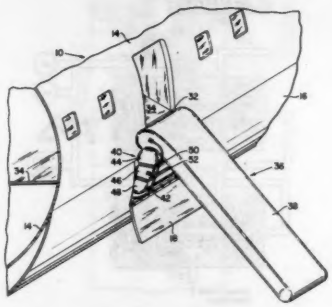
Protection against refrigeration compressor burnout by short cycling is provided by a delay timing mechanism having a motor and solenoid. The motor is constantly energized and the solenoid controlled by a thermostat stalls or releases the mechanism causing timer operation through its cycle. The timer runs through its delay period during the normal off period, allowing fast restart of the compressor. Also the timer provides a longer delay following a short cycle then following a normal cycle. This is accomplished by operating the timer for a period of time after the compressor is started.

3,598,215

INFLATABLE ESCAPE SLIDE

James R. Summer, Brielle, and Henry C. MacLaughlin, New Shewsbury, both of, N.J., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 28, 1968, Ser. No. 755,987
Int. Cl. B65g *11/10*
U.S. Cl. 193—25 **10 Claims**



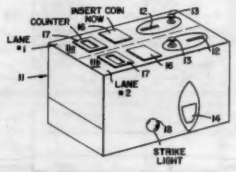
An inflatable escape slide stowed in an exterior aircraft compartment has an inflatable column structure attached to one end of the inflatable slide structure. The column structure is secured to the aircraft at a point distal of the egress door of the craft and securely positions the upper end of the slide immediately adjacent the door sill upon inflation. The column structure thus secures and supports the slide end for passenger egress.

3,598,216

APPARATUS FOR THE IMPROVEMENT OF BOWLING SKILLS

Richard W. Munroe, 1275 El Camino Road, Millbrae, Calif., and Ronald G. Munroe, 27 Hastings Road, Old Bridge, N.J.

Filed June 26, 1968, Ser. No. 740,256
Int. Cl. G07f *5/10*
U.S. Cl. 194—9 **9 Claims**



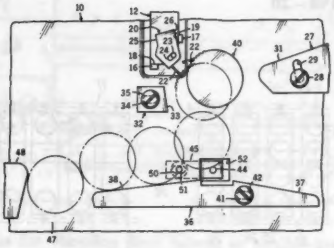
Apparatus for use in a bowling game having an automatic pinsetter. If the bowler bowls a strike after a coin is inserted in the apparatus visual indicating means are actuated. Time delay means ensure that the coin must be inserted before the ball is thrown.

3,598,217

COIN-SELECTING ASSEMBLY FOR SERRATED COINS

Kenneth E. Hammond, Scarborough, Ontario, Canada, assignor to Coin Acceptors, Inc., St. Louis, Mo.

Continuation-in-part of application Ser. No. 758,745, Sept. 10, 1968. This application Mar. 28, 1969, Ser. No. 811,401
Int. Cl. G07f 3/02
U.S. Cl. 194—97 14 Claims



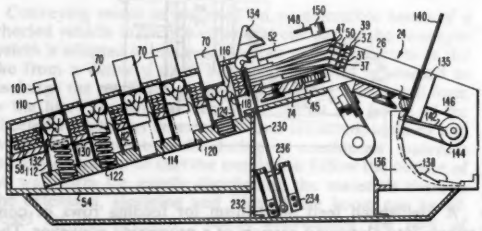
The selector assembly includes a support plate and a rail adjacent thereto which directs a coin into a coin serration detector assembly. The serration detector assembly includes a serration detector balance means pivotally mounted to the support plate and having a sensing feeler projecting outwardly from the balance means and into the trajectory of the coin. Engagement of a nonserrated coin deflects the feeler and balance means in an upward direction, the coin being thereby directed into contact with, and rebound from, a kicker plate below the detector assembly. Engagement of a serrated coin rotates the feeler and balance means and moves the feeler in a downward direction, the coin being thereby directed onto a second kicker from which it rebounds in a different path from that taken by a nonserrated coin.

3,598,218

MECHANICAL TYPE-PRINTING APPARATUS

Paul Anthony Gilovich, San Jose; Reynold Benjamin Johnson, Palo Alto; Edward Everett Long, San Jose; David Harwood McMurtry, Portola Valley; Ernie George Nassimbene, San Jose; Thomas Frank O'Rourke, San Jose, and George Edmund Price, San Jose, all of, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,653
Int. Cl. B41j 5/00
U.S. Cl. 197—1 6 Claims



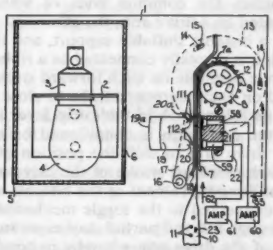
The use of Computer Assisted Instructional Systems and other electronic data processing systems is enhanced by a simple, low-cost, key-responding mechanical type-printing apparatus for printing human and machine readable characters of a family of type of which each character has no more than 12 segments. The generic type family format is a medianly quartered parallelogram (MQP) embracing both slanted and upright printing, the latter being more specifically in the format of an orthogonally quartered rectangle (OQR). The printing apparatus comprises a multiple of printing blade elements arranged as a subassembly for printing short straight line segments by impressing the ends of the blade elements on the record medium against a platen. Liquid ink is fed to the blade elements made up of several leaves between which the ink flows by way of capillary action. The proper blades are selected for printing the corresponding segments making up a desired character by means of a stack of selector plates. There is one selector plate individual to each blade element and a 13th, spacing, plate. Each of the selector plates are of integral construction having a selecting section, the front edge of which is to be moved in a direction forcing the associated printing blade element forward for printing the corresponding line segment, and two guiding sections for insuring parallel movement of the selecting section. Each of the selecting sections of the selector plates has a multiple of substantially square apertures in registry with corresponding apertures in all of the other plates. Keys are extended through the apertures in all of the selector plates in registry. The keys in the plates have surfaces cooperating with edges of the apertures of the plates defining the forward direction of the plates of two different characteristics distributed in predetermined permutation for all of the keys. Depressing a key shifts the selector plates relative to one another in accordance with the distribution of the two different characteristics. The guiding sections of the plates are pivoted at central points so that the selecting sections move directly forward regardless of the location of the particular key which is actuating the plates. The leading edge of the selector plates for the particular character desired may bear directly against the ends of the blade elements remote from the printing ends, but preferably linking elements are interposed between the printing blade elements and the selector plates. These linking elements are particularly desirable when the direction of travel of the printing blade element is at an angle with respect to the direction of travel of the selector plates. Specifically, the square apertures of the plates which are to remain at rest for the selection of a given character are enlarged so that depressing the associated key will not move them forward. A camming element is arranged in the apertures between the actuating surface of the keys and the actuating surfaces of the selector plates to provide more uniform motion. The subassembly of printing blade elements and the subassembly of linking elements are arranged in a carrier which is stepped across the leading edge of the selector plates in response to actuation of the 13th or spacing selector plates. When the carrier has arrived at the end of the line, it is manually returned to the beginning of the travel and the record medium is advanced automatically one line in readiness for the next line of printing. Preferably, the printing blade element assembly, the escapement mechanism, and record-medium-advancing mechanism are designed so that different sized characters may be printed and spaced accordingly.

3,598,219

APPARATUS FOR POSITIONING RECORDS

Ronald Henry Lee, Stevenage; Dennis Frank Edwin Pidgeon, Letchworth; Thomas Drew Powrie, Stevenage, and John Henry Coyne, Letchworth, all of, England, assignors to International Computers and Tabulators Limited, London, England

Filed Feb. 28, 1968, Ser. No. 708,922
Claims priority, application Great Britain, Mar. 8, 1967, 10,793/67
Int. Cl. B41j 15/00
U.S. Cl. 197—133 2 Claims



An arrangement for controlling the positioning of a record, typically for controlling the position of a sheet in relation to a

line printer, by means of a program tape advanced in synchronism with the record is described. The program tape is advanced under control of an impulse-driven electric motor, the driving pulses for the motor being derived from a pulse generator included within the record feeding arrangement. The program tape carries perforations indicative of those positions in which the record is to be stopped for the purpose, for example, of receiving lines of print. The perforations in the tape are sensed photoelectrically to control the record feeding arrangement.

A two-speed drive is used to feed the record and in one embodiment, which uses two tape-sensing stations, the record, if it is being fed at the higher speed, is slowed down in response to the output from one (advanced) sensing station and is finally brought to rest in response to the output from the second sensing station. In starting up the record-feeding device, a circuit arrangement using a counter is employed. The record movement is started at the slower speed and the counter permits the movement to continue at the higher speed provided that a stop signal is not sensed from the tape within a distance determined by the capacity of the counter.

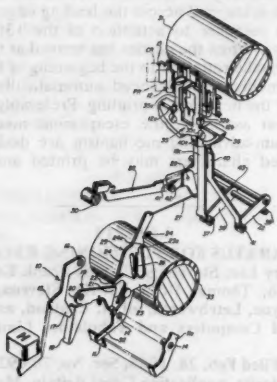
In another embodiment a third tape-sensing station is added to provide more advanced information on the occurrence of a stop signal in the tape, and the record-feeding device is coupled to the higher speed drive upon starting unless a stop signal is detected within the area of tape scanned by the advanced sensing stations.

3,598,220

RIBBON-LIFTING MECHANISM FOR A TYPEWRITER

Robert E. McGrath, Rocky Hill, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,570
Int. Cl. B41j *35/22, 33/56*
U.S. Cl. 197—156 **5 Claims**



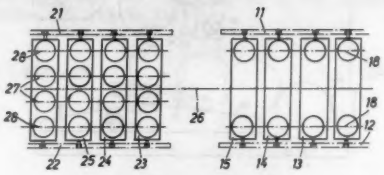
A ribbon-lifting mechanism for a typewriter comprising a toggle mechanism the common ends of whose links are pivotally mounted on a drive arm, the other end of one link is fulcrumed on a bistable shiftable support, and the other end of the other link is pivotally connected to a ribbon lift crank. The drive arm is operable on each forward stroke to open or straighten and on each rearward stroke to close or break the toggle about its fulcrum. A bistable trip lever also pivotally mounted on the drive arm is conditioned on each forward stroke of the drive arm to shift the position of the bistable support on each rearward stroke of the drive arm, and as a result of the shifting movement of the bistable support a ribbon vibrator connected to the toggle mechanism is elevated alternately through full and partial strokes on succeeding forward strokes of the drive arm whereby in combination with ribbon movement a zigzag pattern is defined on a carbon ribbon to utilize the maximum area of the carbon ribbon.

3,598,221

TRANSFER APPARATUS FOR EXCHANGING ARTICLES BETWEEN TWO CONVEYORS

Norbert Klimaschka, Selb, Bayern, and Josef Pollmann, Reichenbach, Bayern, both of, Germany, assignors to Gebruder Netzsch Maschinenfabrik, Bayern, Germany

Filed Sept. 8, 1969, Ser. No. 855,994
Claims priority, application Great Britain, Sept. 12, 1968, 43448/68
Int. Cl. B65g *47/26, 47/52*
U.S. Cl. 198—20 **24 Claims**



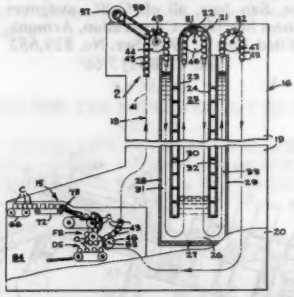
Apparatus for transferring molds for ceramic blanks or the like between a first conveyor associated with a molding machine, and a second conveyor which is associated with a drier and receives molds filled with blanks from the first conveyor and delivers empty molds back to it, twice as many molds being disposed one beside the other on the second conveyor as on the first conveyor.

3,598,222

HIGH-SPEED FEED MECHANISM

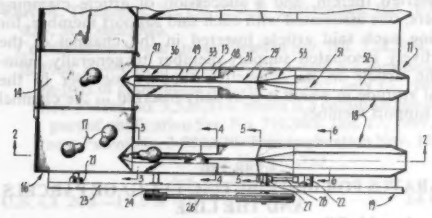
Samuel A. Mencacci, Wilrijk, Antwerp, Belgium, assignor to International Machinery Corporation S. A., St. Niklass-Waas, Belgium

Filed Apr. 3, 1969, Ser. No. 813,814
Int. Cl. B65g *47/24*
U.S. Cl. 198—30 **23 Claims**



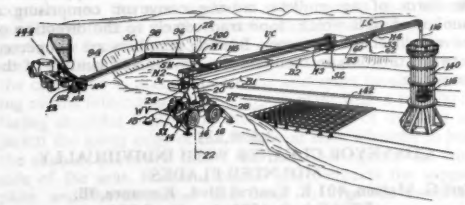
A high-speed feed mechanism for feeding rows of containers into elongated carriers of a processing conveyor. The mechanism moving containers that are supported on their ends and are divided into independent lanes between timing belts driven at or slightly less than the desired feed rate. The containers in each lane being separated and twisted into horizontal position for combining with other containers from other lanes in a transfer conveying means to form full or partial rows of containers moving at the same speed as the carriers of the processing conveyor. Independently controlled arresting means are provided for each lane of containers to momentarily terminate movement of the containers in a portion of the lane in the event the supply of containers in that lane is not as desired.

3,598,223
PEAR ORIENTATION APPARATUS
George E. Lauer, 2960 Chapman St., Oakland, Calif.
Filed Sept. 15, 1969, Ser. No. 858,076
Int. Cl. B65g 37/00
U.S. Cl. 198—33 AA 5 Claims



Apparatus for orienting pear halves, or similar irregularly contoured objects, with the cut flat face down and in longitudinal alignment with their direction of travel along the apparatus. The apparatus is such as to cause a pear half preliminarily oriented in a generally face down position to gravitally align itself at both its enlarged and narrow ends and be maintained in a final position of face down longitudinal alignment.

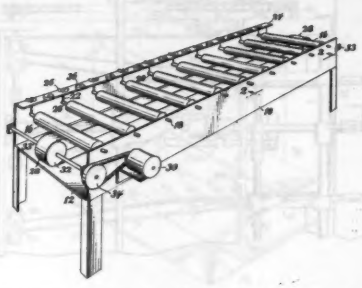
3,598,224
BOOM MOUNTED CONVEYING MEANS
Robert F. Oury, Elmhurst, Ill., assignor to Rotec Industries, Inc.
Filed Nov. 22, 1968, Ser. No. 778,242
Int. Cl. B65g 15/26
U.S. Cl. 198—65 14 Claims



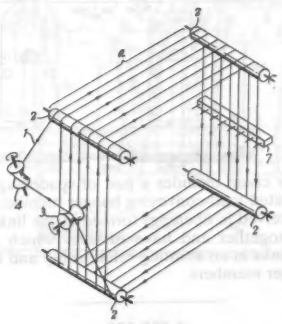
Conveying means is mounted on an extensible boom of a wheeled vehicle in such manner that one end of the conveyor system is adapted to receive materials such as concrete or the like from a delivery truck and the other end is adapted to discharge the materials, as through a tremie, into a wall form or the like. The arrangement is such that the boom of the wheeled vehicle can be extended and retracted, inclined and swung from side to side during a continuous materials delivery operation so that the tremie can follow the outline of the wall form for evenly distributing the materials therein. The extension, elevation and wing of the boom can be effected by the operator without interrupting the flow of materials, and the form filling job can therefore be completed in a minimum of time.

3,598,225
ACCUMULATING CONVEYOR
Lee Merrick, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Apr. 10, 1969, Ser. No. 817,259
Int. Cl. B65g 13/02
U.S. Cl. 198—127 4 Claims

A roller conveyor of the accumulation type by which articles such as cartons to be conveyed from one place to another are supported on driven rollers. The articles on the rollers being so moved from one location to another are subject to stoppage or intermittent movement on the surface of the conveyor without causing congestion and pileup of such articles which might effect their jamming and breakage.



3,598,226
CONVEYORS
Lawrence Frederick Hayman, England, assignor to Stone-Platt Crawley Limited, London, England
Filed May 27, 1969, Ser. No. 828,228
Claims priority, application Great Britain, June 6, 1968, 27047/68
Int. Cl. B65g 15/10
U.S. Cl. 198—129 8 Claims

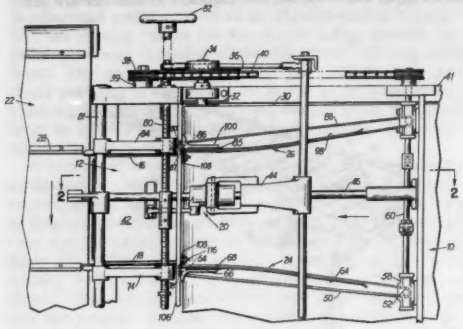


The invention concerns a continuous article-carrying conveyor, particularly a conveyor for carrying textile articles through a processing machine. The conveyor consists of individual filament flights disposed at predetermined intervals across the conveyor and forming a continuous helical or spiral coil. The term filament is to be understood to include thread.

3,598,227
BELT-TRACKING COMPENSATOR
Arthur Stanford, Richmond, Va., assignor to A M F Incorporated
Filed June 2, 1969, Ser. No. 829,689
Int. Cl. B65g 15/14, 15/30
U.S. Cl. 198—165 10 Claims

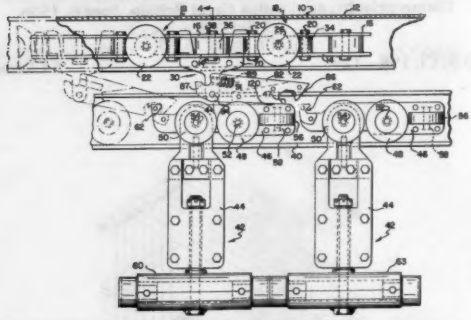
Materials-handling apparatus, which comprises means for advancing an article along a predetermined path, conveyor means provided at the sides of said predetermined path for guiding products therealong, means for varying the spacing

between at least certain portions of said side conveyor means, and means for compensating for changes in tension in



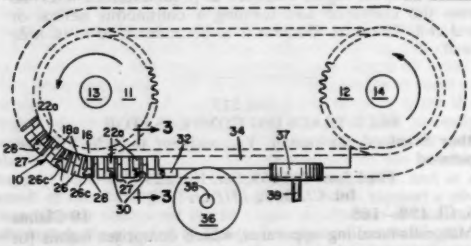
said side conveyor means as the spacing between portions thereof is varied.

3,598,228
CONVEYOR CHAIN
George R. Pipes, South Euclid, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Dec. 24, 1969, Ser. No. 887,862
Int. Cl. B65g *17/20*
U.S. Cl. 198—177 **12 Claims**



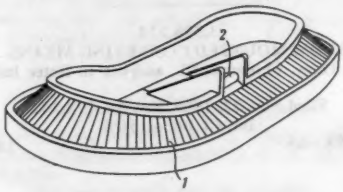
A conveyor chain includes a pair of spaced-apart links. A pair of bifurcated load-conveying hanger members have arms which are received in openings formed in the links. The arms are secured together and have surfaces which engage surfaces of the links in an abutting relationship and thereby support the hanger members.

3,598,229
ARTICLE CONVEYOR
Anthony A. Spycher, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Dec. 1, 1969, Ser. No. 881,231
Int. Cl. B65g *15/00*
U.S. Cl. 198—179 **10 Claims**



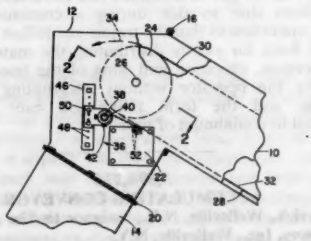
A conveyor for transporting or conveying a succession or plurality of relatively elongate articles through a looped path of travel for operations or work to be performed thereon. Each such article may comprise, for purposes of example only, a bundle of fiber optics at least one end of which is to be trimmed and thereafter polished to provide a suitable light-transmitting optical surface thereon. The conveyor comprises a pair of first and second articulated chains which carry, respectively, a succession of article support members each of which have channels therein for receiving an end portion of one of said articles to be transported or conveyed and inserted therein, and a succession of article clamping members, one associated with each said support member, for clamping each said article inserted in the channel of the respectively associated support member to generally maintain the article in its respective support member in the general attitude in which it is initially inserted in the channel of the support member.

3,598,230
APPARATUS FOR DISTRIBUTING LUGGAGE PARCELS AND THE LIKE
Dennis Arnold Riley, Erith, England, assignor to Sovex Limited, Kent, England
Filed May 23, 1969, Ser. No. 827,282
Claims priority, application Great Britain, June 13, 1968, 28282/68
Int. Cl. B65g *17/24*
U.S. Cl. 198—181 **8 Claims**



This invention relates to luggage distribution apparatus in the form of an endless moving conveyor comprising a number of slats which slope transversely to the direction of movement of the conveyor. Bracing members are connected between the slats to facilitate the driving and guiding of the conveyor.

3,598,231
CONVEYOR CLEANER WITH INDIVIDUALLY MOUNTED BLADES
Carl G. Matson, 401 E. Central Blvd., Kewanee, Ill.
Filed Feb. 9, 1970, Ser. No. 9,823
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 **12 Claims**



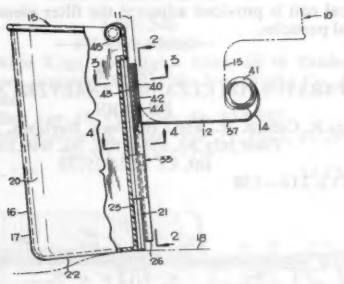
A conveyor cleaner for scraping a conveyor belt, constructed so that each scraper blade is individually mounted and includes a floating connection to a support so that the blades may individually accommodate themselves to differing configurations of the belt. Preferably, each blade is mounted

on an elongated, steel, rodlike arm having its blade-remote end formed as a coil spring encircling the support and provided with a free end adjustably connected to the support for varying the arm bias toward the conveyor.

3,598,232
LITTER DISPOSAL UNIT IN AN AUTOMOBILE ASSEMBLY

Earl M. Trammell, Jr., c/o E.M.T. Enterprises, Inc., P.O. Box 435, St. Louis, Mo.

Continuation-in-part of application Ser. No. 724,509, Apr. 26,1968, now Patent No. 3,547,326, which is a continuation-in-part of application Ser. No. 744,482, July 12, 1968, now Patent No. 3,526,314, which is a continuation-in-part of application Ser. No. 791,940, Jan. 17, 1969, now Patent No. 3,504,830. This application Nov. 12, 1969, Ser. No. 875,753
Int. Cl. B60n *3/08*
U.S. Cl. 206—19.5 R **14 Claims**



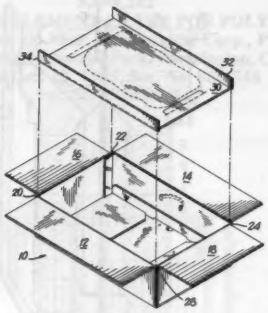
A utility device, such as a litter container or the like, is held against the front side of the automobile seat that is selectively adjustable in position forwardly, rearwardly, upwardly or downwardly. The mounting means connecting the container to the seat includes a key means that interfits guideways formed on the container rear wall and on a support plate located adjacent the container rear wall, the key means being slidably movable upon vertical adjustment of the container to accommodate the underseat height. Clamping means interconnects the support plate with a rearwardly facing shoulder formed on the bottom side of the seat adjacent the lower edge of the front seat side, whereby to hold the support plate and hence the container against the front side of the seat. Resilient means interconnects the support plate and the container and tends to urge the container downwardly. In one embodiment, the clamping means includes a pair of brackets interconnected by an adjustable fastener, one bracket being secured to the support plate and the other bracket engaging the shoulder. In another embodiment, the clamping means includes a flat coil spring having one end fixed to the support plate and the opposite coiled end engaging the seat shoulder to urge the support plate and container against the front seat side.

3,598,233
CONTAINER

Robert Jasinover, 21 Culver Court, Huntington Station, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,773
Int. Cl. B65d *5/50, 13/00*
U.S. Cl. 206—45.19 **1 Claim**

A container suitable for transporting and displaying a plurality of variously shaped articles is shown. It includes a conventional die-cut, corrugated fiberboard, shipping container having four regular, slotted bottom flaps. The two end panel flaps are offset to the thickness of a platform to which the articles are "skin filmed." The platform has two edge flaps and four offset stems located at each of its corners. The stems rest upon the bottom edges of the container during assembly, the container and platform both being inverted, and the edge flaps are snugly wedged against the offset end flaps and sandwiched between the end panel flaps and the side panel flaps of the container. The container is easily assembled and is a

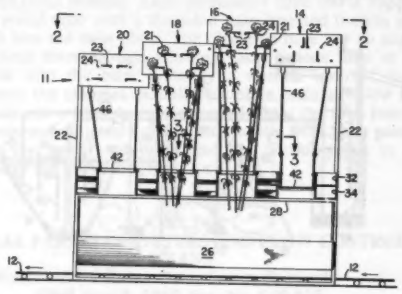


mechanically tight and shock insulated container for sample articles.

3,598,234
CENTRAL GRADING SYSTEM FOR CUT FLOWERS

Gerald L. Gregoire, San Rafael; Kenneth R. Duff, Petaluma, and George E. Kemper, San Francisco, all of, Calif., assignors to Gregoire Flowers, Inc., San Francisco, Calif.

Filed Feb. 26, 1970, Ser. No. 14,616
Int. Cl. B42f *17/00*
U.S. Cl. 209—123 **9 Claims**



A rack for grading cut flower material includes a bar element and a shelf element which support the flower heads. The shelf element is pivotally mounted for swinging movement about one edge to a vertical position. This increases the space between the bar element and the shelf element and permits easy removal of the bunch.

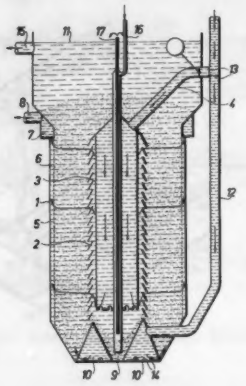
3,598,235
PROCESS AND EQUIPMENT FOR THE PURIFICATION OF LIQUIDS BY FILTRATION

Laszlo Demeter, Budapest, Hungary, assignor to Nikex Nehezipari Kulkereskedelmi Vallalat, Budapest, Hungary

Filed June 10, 1969, Ser. No. 831,854
Int. Cl. B01d *23/10, 29/38*
U.S. Cl. 210—80 **2 Claims**

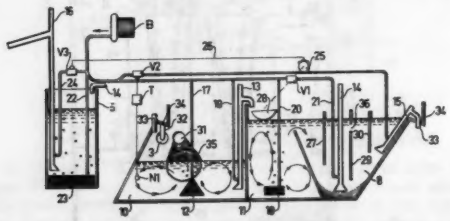
Liquid to be filtered enters a distributor and then passes through a wall comprised of downwardly inclined shutters into a vertical filter column for horizontal flow through the filter material and thence through a sieve to the filtrate outlet. To wash the filter, wash liquid is forced into the column from below with the outlet closed, so that the column

backwashes through the shutters to the distributor, below which the washed-out material collects. An air lift raises this



collected material to the top of the filter column, from which the material other than the filter medium is decanted.

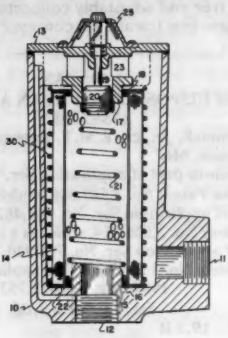
3,598,236
SYSTEM FOR PURIFYING SEWAGE WATER BY MEANS OF FLOCULATION AND AERATION
Nils-Olof Nordlander, Sigtuna; Sixten Englesson, Djursholm, and Sven Gustaf Yngve Gamer, Norrkoping, all of, Sweden, assignors to Stenberg-Flygt AB, Solna, Sweden
Filed Feb. 18, 1969, Ser. No. 800,155
Claims priority, application Sweden, Aug. 8, 1968, 10,727
Int. Cl. C02c *5/10*
U.S. Cl. 210—104 **11 Claims**



A system for purifying sewage water by flocculation and aeration using a buffer chamber, a flocculating chamber, a sedimentation and sludge concentration chamber and a regenerating and sludge activating chamber. The system uses activated sludge as a flocculating agent. The system further comprises a mammoth pump between the buffer and flocculating chambers and another between sedimentation and regenerating chambers. A tiltable bucket regulates the sludge feed to the regenerating chamber permitting a part of the fluid flow to pass by the side. The bucket by means of a valve, further controls a driving air supply to another mammoth pump, the transmitted quantity of activated sludge to the regenerating chamber being thus adjusted to match the quantity of sewage water measured by the bucket.

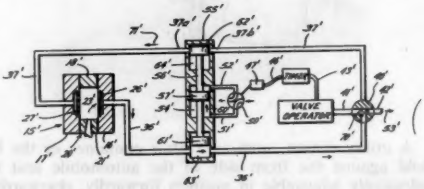
3,598,237
FILTER
Ronald A. Aspinwall, Detroit, and MacKellar K. Graham, Birmingham, both of, Mich., assignors to Sperry Rand Corporation, Troy, Mich.
Filed Sept. 5, 1969, Ser. No. 855,693
Int. Cl. B01d *27/10*
U.S. Cl. 210—130 **8 Claims**

A filter including a cylindrical filter element which is arranged to normally have fluid pass therethrough. A bypass valve is provided to bypass fluid directly to the outlet when the pressure at the inlet becomes excessive. A magnetized



helical coil is provided adjacent the filter element to attract metal particles.

3,598,238
APPARATUS FOR CLEANING ANALYZER AND OTHER FILTERS
Henry R. Collins, Jr., 4507 Hemlock, Baytown, Tex.
Filed July 30, 1969, Ser. No. 846,200
Int. Cl. B01d *29/38*
U.S. Cl. 210—138 **3 Claims**

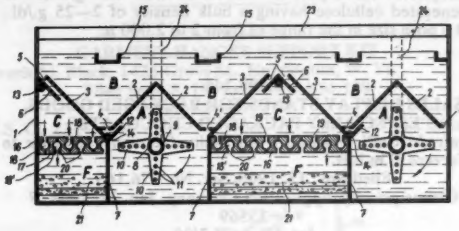


There are two preferred embodiments to this invention. In one preferred embodiment a dual filter screen, small particle bypass filter is secured with a timing device and valve-switching means to permit sample analyzer stream flow through alternate sides of the filter. The swirling action of the stream flow in the body alternately washes and cleans the small particle filter screen not in use. In the other preferred embodiment a double actuating piston is positioned between the outlet streams of each of the filter caps of the filter body and a timing mechanism actuates the piston to alternately block one of the filtered streams. As the cylinder heads of the piston move into the respective filtered stream, the head moves fluid in the stream back toward the filter body and through the respective filter screen associated with each stream to back wash the respective small particle filter screen and remove clogged materials on the filter screen.

3,598,239
APPARATUS FOR WATER TREATMENT
Svatopluk Mackrle, and Vladimir Mackrle, both of Prague, Czechoslovakia, assignors to Hydroconsult Bratislava, Bratislava, Czechoslovakia
Continuation of application Ser. No. 822,383, May 7, 1969, now abandoned. This application Oct. 2, 1969, Ser. No. 868,266
Int. Cl. B01d *21/01*
U.S. Cl. 210—203 **9 Claims**

A high-output arrangement for water treatment combining in a single housing a number of spaces for coagulation and homogenization, spaces where a perfectly fluidized sludge blanket is maintained, sedimentation spaces and high-rate filter spaces. The spaces for the fluidized sludge blanket have bottoms formed by downwardly converging walls extending over the entire width of the housing and alternately forming roof-shaped tops of homogenizing spaces and of sedimentation spaces as well as the bottoms for the sludge blanket spaces above them. Filter spaces are provided below the

homogenizing spaces, separated therefrom by horizontal walls composed of adjacent beams with first channels provided with openings into the sedimentation spaces and connected with the drain, and second channels provided with

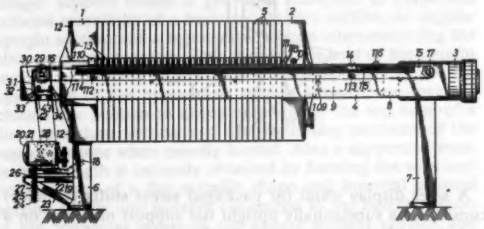


openings into the filter spaces and connected to collecting means for clear water. The homogenizing space is provided with agitator means, and raw water with a coagulation agent is supplied into said space.

3,598,240
FILTER PRESS

Ikuya Abe; Akio Kaga, and Hideo Eoka, all of Taisho-ku, Osaka, Japan, assignors to Noritake Iron Works Co., Ltd., Osaka, Japan

Filed Apr. 10, 1969, Ser. No. 814,975
Claims priority, application Japan, Apr. 17, 1968, 43/25981
Int. Cl. B01d *25/00*
U.S. Cl. 210—230 **14 Claims**

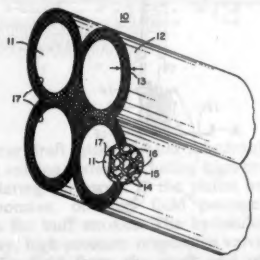


This filter press includes filter-plate-feeding members adapted for moving a plurality of filter plates backward one by one by passing the plates under the hangers of said train of filter plates and catching the same. The filter-plate-feeding members each have an opposed pair of pawls that can be freely raised, the front pawl thereof passing under the hanger and catching the same, the rear pawl abuts against said hanger and brings the same into a halt. The pair of pawls of the members are retreated and changed in operation in order to advance the plates one by one.

3,598,241
SUPPORT SYSTEM FOR MEMBRANES USED IN THE REVERSE OSMOSIS PROCESS

Charles H. Vondracek, Pittsburgh, and Andrew S. Calderwood, Monrolburgh, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 22, 1968, Ser. No. 754,581
Int. Cl. B01d *13/00*
U.S. Cl. 210—321 **8 Claims**

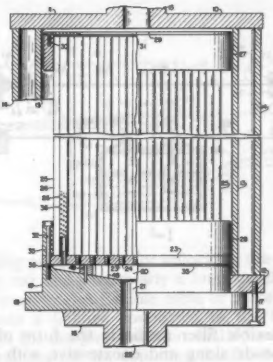


An open pore tube for use with reverse osmosis water purification membranes is made of bonded resin coated filler particles.

3,598,242
MULTIPLE ELEMENT FILTER FOR POLYMERS

Lambert H. Mott, c/o Mott Metallurgical Corp., P.O. Drawer "L", Farmington Industrial Park, Farmington, Conn.

Filed Dec. 19, 1969, Ser. No. 886,546
Int. Cl. B01d *29/24*
U.S. Cl. 210—323 **5 Claims**

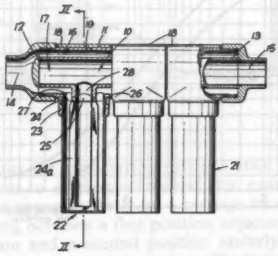


A high differential pressure filter with a large filter area has a base plate containing threaded apertures over which there is secured a bundle of perforated tubes fixed together in a hexagonal pattern. Each perforated tube has a capped porous metal tube with a threaded base inserted therein and screwed into the base plate. The threaded base has an angular channel therethrough allowing each porous tube to be tightened into the base plate by a wrench inserted from below into the channel. A collector plate is fixed below the base plate and a filter body is disposed about the tube bundle so that viscous material introduced into the filter body passes through the perforated tubes and the porous tubes to be gathered in the collector plate.

3,598,243
PLURAL PARALLEL FILTERS AND FLOW CONTROL MEANS

Janusz Gutkowski, 7 Rufus Close, Lewes, England

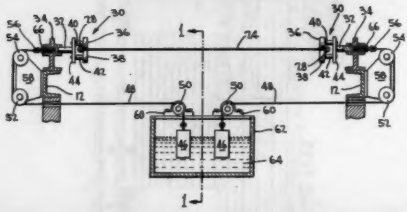
Filed June 3, 1969, Ser. No. 830,015
Claims priority, application Great Britain, June 4, 1968, 26501/68
Int. Cl. B01d *29/24*
U.S. Cl. 210—340 **12 Claims**



A fluid treatment apparatus having a plurality of treatment units, one of which units can be isolated from a stream of

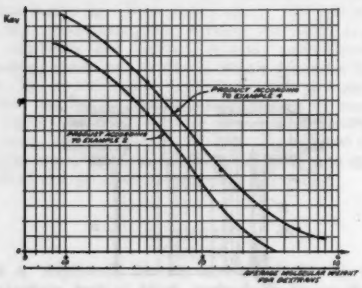
fluid flowing through the apparatus by rotation of the unit about galleries through which fluid normally flows to and from that unit.

3,598,244
FILTER BELT ALIGNING
Richard E. Babcock, Jr., Waterloo, Va., assignor to Komline-Sanderson Engineering Corporation, Peapack, N.J.
Filed Oct. 14, 1969, Ser. No. 866,300
Int. Cl. B01d *33/04*
U.S. Cl. 210—401 **7 Claims**



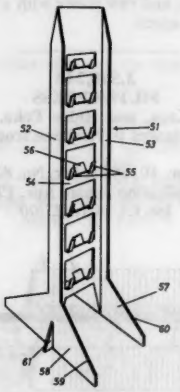
A porous flexible filter media in the form of an endless belt, having beads along and coextensive with its opposite side edges is guided in an endless circuit around various rollers rotating about horizontal axes and including a filter drum and a discharge roll spaced from the drum. For tensioning the media transversely to its movement and for maintaining it centered axially with respect to the drum, a pair of weights are suspended normally at a common level partially immersed in a body of liquid, being supported by cables guided over pulleys or sheaves and connected to the opposite side edges of the filter media by suitable guides respectively mounted in alignment with each other for horizontal movement transverse to the movement of the filter media through its circuit.

3,598,245
SEPARATION MEDIUM FOR GEL FILTRATION AND A METHOD FOR ITS PREPARATION
Helmut Determann, Frankfurt am Main, and Theodor Wieland, Mainz, both of, Germany, assignors to Pharmacia Fine Chemicals A B, Uppsala, Sweden
Filed Oct. 27, 1969, Ser. No. 869,795
Claims priority, application Sweden, Oct. 30, 1968, 14668/68
Int. Cl. B01d *15/08*
U.S. Cl. 210—500 **10 Claims**



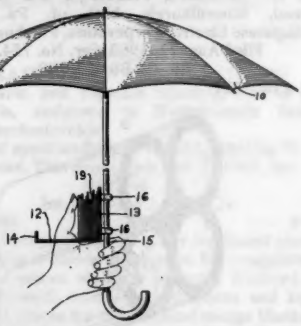
A separation medium for gel filtration having an exclusion limit within the molecular weight range of from 10,000 to 10 million consisting of grains of certain water-insoluble copolymers reinforced with a rigid hydrophilic macroporous material, and method for the preparation thereof. The rigid hydrophilic macroporous material can be grains of regenerated cellulose having a bulk density of 2—25 g./dl., and a pore size in the range of from 2 to 2,000 μ.

3,598,246
SALES DISPLAY STANDS FOR PACKAGED GOODS, ESPECIALLY PACKAGED CHOCOLATES
Manfredo Galli, Frankfurt am Main, Germany, assignor to Ferrero G.m.b.H.
Filed Nov. 15, 1968, Ser. No. 776,165
Claims priority, application Germany, Jan. 22, 1968, F 33569
Int. Cl. A47f *7/00*
U.S. Cl. 211—49 R **8 Claims**



A sales display stand for packaged sweet stuffs (candies) consists of a substantially upright flat support mounted on a pedestal with sloping top surfaces the support having a series of vertically spaced flaps on both sides obliquely projecting outwardly and upwardly. A candy package is attached at one end to each flap by slitting between the lid and base of the package a sufficient portion to be hooked over the flap. The lowermost package of the stack thus secured rests on the sloping base.

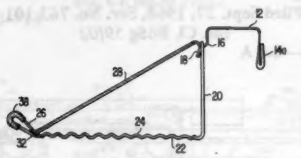
3,598,247
THUMB TRAY
Garry G. Papers, P.O. Box 297, Denville, N.J.
Filed Nov. 24, 1969, Ser. No. 879,350
Int. Cl. A47f *7/00*
U.S. Cl. 211—50 **1 Claim**



A tray for holding data sheets, mail and the like in which a bottom portion of the tray has a slot for a thumb to be in-

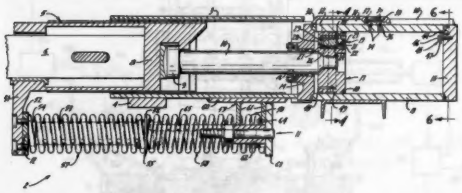
serted to press the data sheets against a back wall, leaving the other fingers free to grip a handle to which the tray is attached.

3,598,248
GARMENT HANGER SUPPORT KIT
Frank M. Black, 1425 Grove St., Huntington, W. Va.
Filed Sept. 8, 1969, Ser. No. 856,109
Int. Cl. A47f *5/08*
U.S. Cl. 211—106 **3 Claims**



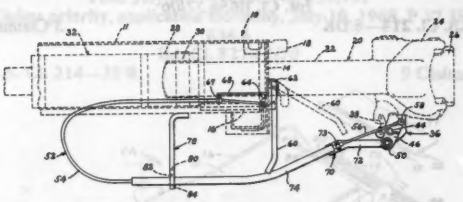
A laterally stable garment hanger support kit means for supporting a plurality of garment hangers from an upright and top edge of a door or wall moulding and the like. The support means is composed of a desirable suitable material, such as, fairly heavy metal wire having a certain degree of elasticity but at the same time sufficient rigidity to retain its original shape under load, even when heavily loaded. The hanger support means is generally triangular in shape and consists essentially of a basic rod or wire section, an angular upright section and a hypotenuse section interconnecting the above sections together, such that the top end of the upright section is generally looped around a U-shaped portion of the upper end of the hypotenuse section joined to an inverted channellike portion to clampingly engage the top edge of a door to reduce vertical and lateral turning moments of the support means when heavily loaded. Also a support of maximum strength is uniquely obtained by forming the wire sections in part of a flat metallic shape and inverted channel portion rigidly and suitably connected to the height portion of the triangular shape of the hanger support portion and having an additional transverse lateral section bisecting the triangular plane of the triangle shape and substantially bridging the width of the triangular zone for maximum rigidity of the garment hanger support means.

3,598,249
RAILWAY DRAFT APPLIANCE
Harold E. Vickerman, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jan. 27, 1969, Ser. No. 794,125
Int. Cl. B61g *9/12, 11/12*
U.S. Cl. 213—8 **8 Claims**



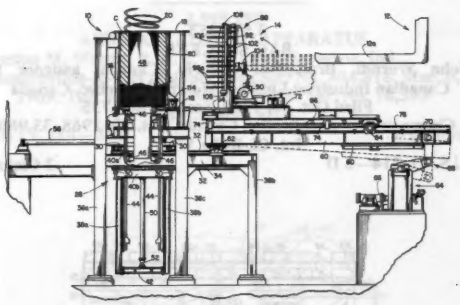
A railroad car draft appliance has a hydraulic cushion assembly with a valving system including high-pressure responsive, buff metering valves set in the piston heads, and low-pressure responsive, one-way fluid passage through the cylinder walls for buff strokes. The hydraulic assembly includes one-way, high-pressure responsive valving which conducts hydraulic fluid from the draft end of the cylinder through a passage chamber disposed along the cylinder sidewall to the buff end on a draft stroke; and the assembly has a mechanical return spring operating to bias the piston to a zero draft neutral position for full stroke buff protection.

3,598,250
UNCOUPLING ARRANGEMENT FOR RAILWAY FREIGHT CARS
Boris S. Terlecky, St. Louis County, and Jan D. Holt, St. Charles, both of, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Oct. 14, 1969, Ser. No. 868,285
Int. Cl. B61g *1/16, 3/08*
U.S. Cl. 213—162 **14 Claims**



An uncoupling arrangement for unlocking the coupler of a railway freight car and particularly a long length freight car having a long overhang. A flexible cable or cablelike member extends between a linkage connected to the lift lifter assembly beneath the coupler and a manual operator adjacent a side of the railway car for actuating the flexible cable and unlocking the coupler. The flexible cable extends from the manual operator first beneath the underframe to the center sill, and then outwardly beneath the coupler shank to the coupler head. Supporting means for the flexible cable react against forces which result from the actuation of the operator thereby to permit an actuating movement of the cable relative to the supporting means for effecting unlocking of the coupler.

3,598,251
COIL-HANDLING APPARATUS
Donald Sieurin, Northboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Filed Dec. 8, 1969, Ser. No. 882,922
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 Q **11 Claims**



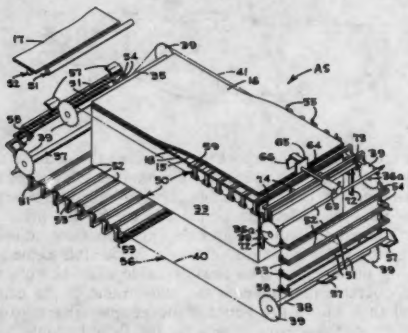
An apparatus for transferring product coils from a coil-forming station to a transport means, for example a hook conveyor. The apparatus includes a carriage movable along a track extending between a first position adjacent to the coil-forming station and a second position underlying the path travelled by the hook conveyor. A cradle is carried by the carriage. A coil is transferred from the coil-forming station into the cradle and the carriage is then traversed to the second position. While the carriage is moving away from the

coil-forming station, the cradle is tilted to position the coil for axial insertion over an awaiting hook on the hook conveyor. Thereafter, the track is lowered to deposit the coil on the hook. The carriage and cradle are then returned to their original positions and the coil is carried away by the hook conveyor.

3,598,252
APPARATUS FOR ASSEMBLING VENEER INTO PLYWOOD SHEETS

Ronald J. Billett, Sunnyvale, and Veikko K. Viitanen, San Jose, both of, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 1, 1969, Ser. No. 813,812
Int. Cl. B65g *57/06*
U.S. Cl. 214—6 DK **3 Claims**

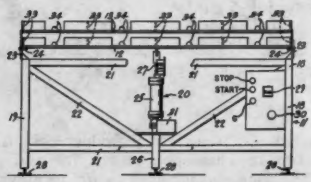


Apparatus for assembling veneer into plywood sheets is disclosed. Two sources of veneer, one above the other, are adjacent an assembly station. The assembly station has a lift table to receive the veneer for assembly. An interrupted slat conveyor takes, alternately, two sheets of veneer from the top source of veneer, and one sheet from the bottom source of veneer. The veneer on the conveyor engages a stop above the lift table to drop between the slats of the conveyor onto the lift table as the slats of the conveyor move out from under the veneer. After each deposit of veneer on the lift table, core pieces are taken from gluing rolls and laid on the deposited veneer, the end core sheet being supported by a retractable support member.

3,598,253
BAG STACKER

John Worndl, Brampton, Ontario, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada

Filed Oct. 13, 1969, Ser. No. 865,735
Claims priority, application Canada, Oct. 30, 1968, 33,960
Int. Cl. B65g *57/11*
U.S. Cl. 214—6 D **2 Claims**

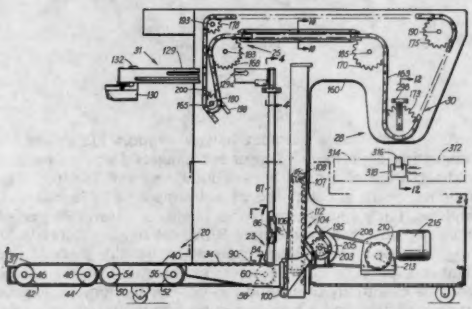


A bag-collecting device for use at the delivery end of a bagmaking machine comprising, in combination, two bag-collecting platens assembled in vertically spaced substantially parallel relationship, each of said platens having a front end and a rear end being coextensive with the other platen at its front end, and means for supporting the platens and reciprocatably moving at least the front ends of said platens between two vertically spaced positions whereby the two platens can be brought into alternative registration with the delivery end of the bagmaking machine, said means for reciprocatably moving the front end of the platens being automatically responsive to a bag counter unit.

3,598,254
PAN FEEDING APPARATUS

Robert F. Meisoll, Henrico County, Va., assignor to AMF Incorporated

Filed Sept. 27, 1968, Ser. No. 763,101
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 A **8 Claims**

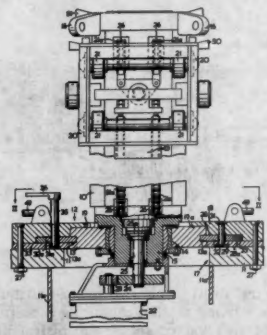


Pan feeding apparatus comprising means for supporting a stack of pans, means for raising said support means to a position whereat the topmost pan is at a predetermined height, means for lifting said topmost pan from the stack and transporting it to a position spaced from a collection area, means for maintaining the topmost pan of the stack at said predetermined height as the pans are removed therefrom and means mounted adjacent said predetermined height for engaging and supporting the last few pans of said stack independently of said support means.

3,598,255
EQUIPMENT FOR HIGH LINE TRANSFER

Stephen G. Schneller, Laval, Quebec, and David G. Lake, Chateauguay Ctr., P. Q., both of, Canada, assignors to Peacock Brothers Limited, La Salle, Quebec, Canada

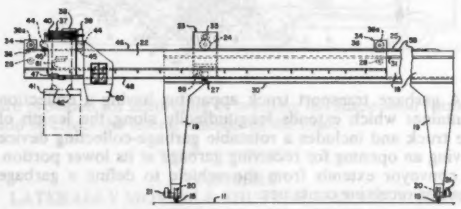
Filed Dec. 26, 1968, Ser. No. 787,164
Claims priority, application Canada, Oct. 28, 1968, 33,722
Int. Cl. B63b *27/18*
U.S. Cl. 214—13 **9 Claims**



A deck fitting for releasably engaging and supporting the base member of a kingpost which is used in high line ship to ship transfer has an aperture for receiving the base member and one or more keys mounted at the side of the aperture. Each key has at least a portion which is movable towards and

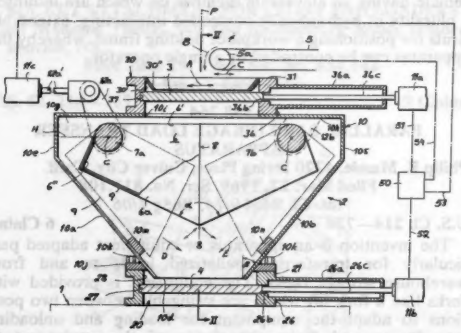
away from the center of the base member between a first position in which said portion protrudes from the side of the aperture to engage and support the base member and the second position in which the key is clear of engagement of the base member and allows a kingpost to be withdrawn to the deck fittings.

3,598,256
CONTAINER SHIP CRANES
Edward J. Kinkopf, Alliance, Ohio, assignor to The Alliance Machine Company
Filed July 17, 1969, Ser. No. 842,470
Int. Cl. B63b *27/12*
U.S. Cl. 214—15 **6 Claims**



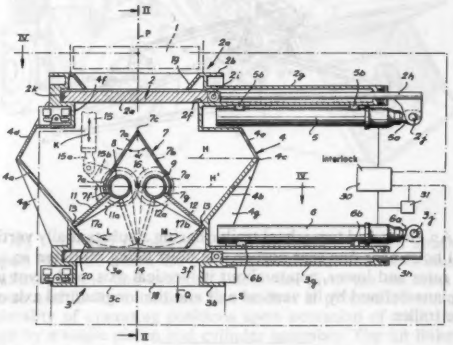
A container ship crane having a single main girder adapted to be carried by spaced apart trackways along each side of ship deck and substantially parallel to the centerline of the ship preferably by inverted substantially T-shaped leg means and having an extensible single girder positioned side by side with said main girder adapted to be extended over a cargo area of the ship and docks on either or both sides of the ship and being supported and guided along said main girder by support means adapted to extend across top portions and down side portions of said main girder, positioned adjacent end portions and intermediate end portions of said extensible girder and having drive means for moving said extensible girder along said main girder mounted on said support means intermediate end portions of said extensible girder and engaging said main girder, and having a hoist means adapted to be driven along the extensible girder preferably by said drive means simultaneously with said extensible girder.

3,598,257
APPARATUS FOR CHARGING SHAFT-TYPE FURNACES
Heinz-Dieter Pantke, Essen-Frintrop, and Herbert Hickmann, Oberhausen, both of, Germany, assignors to Huttenwerk Oberhausen A. G., Oberhausen, Germany
Filed July 7, 1969, Ser. No. 839,451
Claims priority, application Germany, July 10, 1968, P 17 58 637.7
Int. Cl. F27b *1/20*
U.S. Cl. 214—35 R **8 Claims**



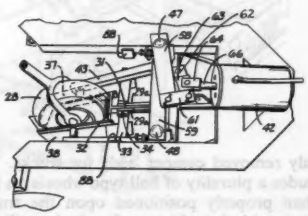
An apparatus for charging shaft-type furnaces in which a pair of gas-lock gates are provided in vertically spaced relationship at the top of the furnace and above the upper gate a conveyor or the like delivers green pellets of metal or for charging the furnace. Between the two gates, there is provided a clamshell charging arrangement having two halves together forming an upwardly open bucket and adapted to swing apart to release the pellets into the chamber. The device has a funnellike configuration with downwardly convergent walls against which the bottom walls of the bucket lie when the shell halves are swung apart.

3,598,258
APPARATUS FOR CHARGING SHAFT-TYPE FURNACES
Rudolf Grewer, Oberhausen, Germany, assignor to Huttenwerk Oberhausen A.G., Oberhausen, Germany
Filed July 8, 1969, Ser. No. 839,951
Claims priority, application Germany, July 10, 1968, P 17 58 636.6
Int. Cl. F27b *1/20*
U.S. Cl. 214—35 R **9 Claims**



An apparatus for the charging and sealing of shaft-type furnaces in which a pair of sliding-plate gas locks are provided above and below a roof-shaped distributor in the charging housing. The distributor coacts with a pair of swingable flaps to prevent free flow of the charge, the flaps being simultaneously swung in opposite senses to open chutes for the charge into the furnace when the lower gate is open.

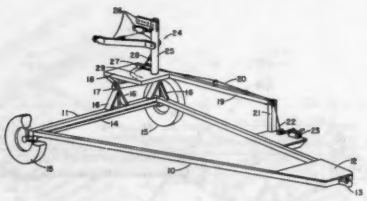
3,598,259
AIRCRAFT TOWING APPARATUS
Preston M. Wright, R. R. 2, Box 110A, Syracuse, Ind.
Continuation-in-part of application Ser. No. 804,818, Mar. 6, 1969. This application Mar. 4, 1970, Ser. No. 16,383
Int. Cl. B60s *9/16*
U.S. Cl. 214—332 **3 Claims**



The present invention is embodied in a powered towing apparatus for aircraft in which the aircraft and the driving

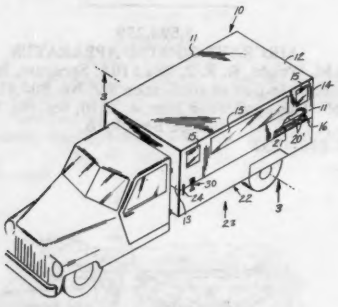
wheels of the prime mover, or tractor component, are connected by a linkage which transfers a portion of the aircraft weight to the driving wheels to aid traction. The linkage sequentially grasps the nose wheel tire on the aircraft and then lifts the aircraft nose wheel through this tire grip. The tire gripping components clasp the tire, prior to lifting, even though the nose wheel tire is not centered or accurately aligned between the gripping components of the linkage.

3,598,260
EQUIPMENT TRAILER
Randall E. Hutson, Hernando, Miss., assignor to General Metals Corp.
Filed Jan. 5, 1970, Ser. No. 591
Int. Cl. B60p *3/06*
U.S. Cl. 214—501 **4 Claims**



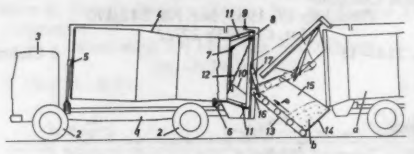
An elongated two-wheel trailer having a substantially vertical hoist near one rear corner, the hoist being mounted so as to raise and lower, rotate about its vertical axis, and pivot in a plane defined by its vertical axis and the longitudinal axis of the trailer.

3,598,261
CAMPER BODY FOR TRUCKS
Luroy A. Anderson, 1417 E. Belleview St., Phoenix, Ariz.
Filed Jan. 6, 1970, Ser. No. 864
Int. Cl. B60p *1/64*
U.S. Cl. 214—515 **5 Claims**



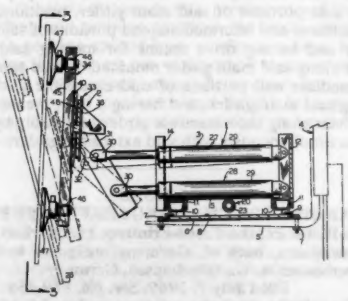
An easily removed camper body for trucks. This camper body includes a plurality of ball type wheels on its underside which when properly positioned upon the truck will seat themselves in with the rubber surfaced edge will cause the assembly to be weather proof. The camper body is also secured in place by straps. The camper body also includes a lever arrangement for unseating the ball type wheels in order to easily remove the camper body from the truck.

3,598,262
GARBAGE COLLECTION VEHICLES
Johann Kraus, Kissing near Augsburg, Germany, assignor to Keller & Knappich GmbH, Augsburg, Germany
Filed July 14, 1969, Ser. No. 841,199
Claims priority, application Germany, Mar. 21, 1969, P 19 14 382.9
Int. Cl. B60p *1/42*
U.S. Cl. 214—522 **2 Claims**



A garbage transport truck apparatus having a collection container which extends longitudinally along the length of the truck and includes a rotatable garbage-collecting device having an opening for receiving garbage at its lower portion. A conveyor extends from the vehicle to define a garbage transfer-receiving container.

3,598,263
PLATE GLASS HANDLING DEVICE
Robert J. Ehmke, 3307 N. 84th St., Milwaukee, Wis.
Filed Jan. 9, 1969, Ser. No. 790,007
Int. Cl. B66c *1/02*
U.S. Cl. 214—652 **6 Claims**

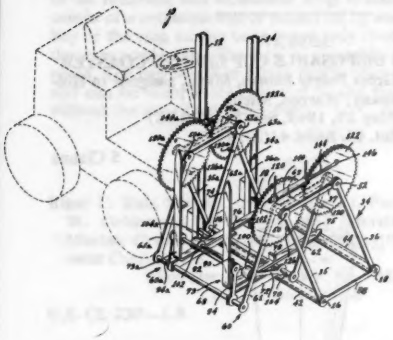


A handling apparatus for lifting, transporting, tilting and positioning heavy workpieces, such as plate glass, or other large, cumbersome objects which require accurate placement and smooth, precision handling. The apparatus includes a lift vehicle having an elevatable member on which are mounted a plurality of hydraulically controlled interacting, extendible struts for positioning a workpiece holding frame, whereby the apparatus can be controlled by a single operator.

3,598,264
PARALLEL BAR LINKAGE LOAD TRANSFER APPARATUS
Philip E. Massie, 4220 Irving Place, Culver City, Calif.
Filed Mar. 27, 1969, Ser. No. 811,108
Int. Cl. B66f *9/14;* **B65g** *1/06*
U.S. Cl. 214—730 **6 Claims**

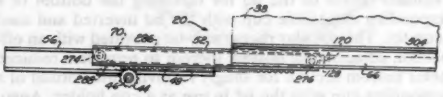
The invention is an apparatus or equipment adapted particularly for transferring palletized loads to and from warehouse storage racks. The equipment is provided with forks like a fork lift which are swingable between two positions to adapt the equipment for loading and unloading laterally to and from either side of the equipment to eliminate the need of turning the transporter equipment in an aisle. The load support means for the fork members is suspended like a pendulum by means of parallel bar linkage

frames whereby the load can be translated horizontally at the same level. Intermeshing gears with hydraulic drive means



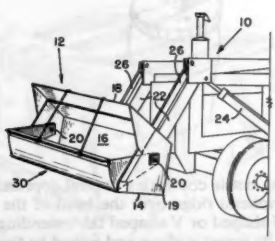
are provided for deforming or warping the suspension frames and to effect the lateral transfer of the load.

3,598,265
LATERALLY MOVABLE SHUTTLE ASSEMBLY WITH AN ARTICLE PROBE DEVICE
Stephen F. Aaronson, 605 Laramie Place, Philadelphia, Pa., and Harry Y. Jackson, 414 Cherry Hill Blvd., Cherry Hill, N.J.
Filed Jan. 5, 1970, Ser. No. 870,643
Int. Cl. B66f *9/14*
U.S. Cl. 214—730 **13 Claims**



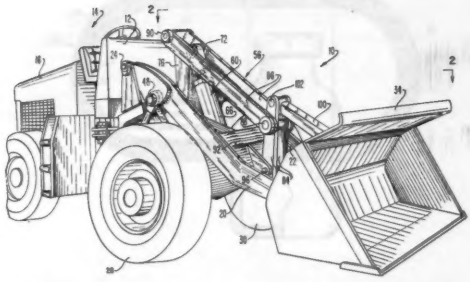
Am improved shuttle assembly is operable from a retracted condition to an extended condition by moving a load-supporting section outwardly relative to an intermediate section while the intermediate section moves outwardly relative to a base section. A probe assembly for detecting the presence of a container or other obstruction in a storage area is mounted on the intermediate section. The probe assembly includes a base which is movable relative to the intermediate section by an operator assembly to extend a probe member on the base outwardly of the load-supporting section in response to relative movement between the intermediate and load-supporting sections. Upon engaging an obstruction in a storage area, the probe member cams or forces an actuator member sidewardly to operate a switch mounted on the intermediate section and thereby interrupts operation of the shuttle assembly toward the extended condition.

3,598,266
BUCKET ATTACHMENT FOR FRONT END LOADERS
Carl Manning Fisher, 540 Old Spartanburg Road, Hendersonville, N.C.
Filed June 19, 1969, Ser. No. 834,742
Int. Cl. E02f *3/70*
U.S. Cl. 214—767 **9 Claims**



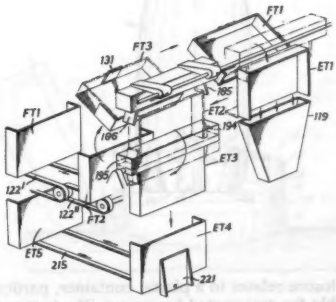
A curved plate extending the width of the bucket is relatively fixed with respect to the boom so that as the bucket is rotated the size of the opening between the bucket and plate can be varied to control the rate of flow of material from the bucket. A funneling mechanism directs the material dispensed from the bucket to a restricted material discharge opening.

3,598,267
LOADER ASSEMBLY
Paul H. Whitcomb, Attica, N.Y., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed June 19, 1969, Ser. No. 834,746
Int. Cl. E02f *3/74*
U.S. Cl. 214—776 **6 Claims**



An improved front end loader includes a pair of spaced-apart lift arms which are pivotally mounted on an articulated vehicle. Piston and cylinder assemblies pivot the lift arms to raise and lower a bucket. The bucket is pivoted between a plurality of operating positions upon actuation of a tilt linkage by a single piston and cylinder assembly. The tilt linkage and associated piston and cylinder assembly are located midway between the lift arms along a vertical plane extending through a longitudinal axis of the vehicle.

3,598,268
ARTICLE CONVEYING AND LOADING MACHINE
Timothy Wallace, Andover, England, assignor to AMF Incorporated, New York, N.Y.
Filed May 14, 1969, Ser. No. 824,599
Claims priority, application Great Britain, May 15, 1968, 23106/68
Int. Cl. B65g *65/34*
U.S. Cl. 214—306 **17 Claims**



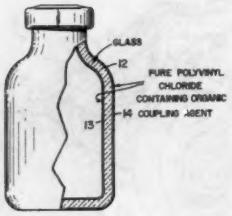
The machine is a loader for a cigarette packer in which a pivoted container conveyor is capable of swinging down to a loading position and swinging up to an inclined position and thereafter to a ready position adjacent a discharge position.

A clamp arrangement is provided for holding a container at the discharge position while it is emptying and for conveying an empty tray from the discharge position to a take away path. Turning mechanism is provided so that the tray in the ready position is pivoted into the discharge position as soon as the empty tray has cleared the discharge position on removal therefrom.

3,598,269
LINED GLASS CONTAINER

Raleigh A. Carmen, Concord, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Aug. 2, 1968, Ser. No. 749,790
Int. Cl. B65d *23/02, 23/08*
U.S. Cl. 215—1 **4 Claims**

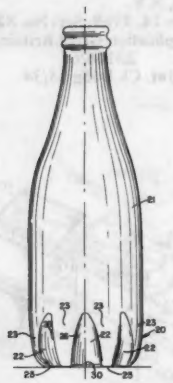


Glass containers lined with polyvinyl chloride containing a bonding agent.

3,598,270
BOTTOM END STRUCTURE FOR PLASTIC CONTAINERS

Domas Adomaitis, Chicago, and Howard M. Turner, Oak Forest, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 14, 1969, Ser. No. 815,745
Int. Cl. B65d *1/02*
U.S. Cl. 215—1 C **8 Claims**

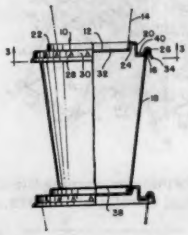


This disclosure relates to a plastic container, particularly a bottle suitable for carbonated beverages. The bottom end of the container comprises portions conformed to meridian elements of a hemisphere with a downward pole and a plurality of hollow legs terminating in feet in a plane below the pole of the hemisphere. In blow-molding the bottle, the mold halves pinch the bottom end of the parison closed along an arcuate weld line constituting the midportion of a semicircular element of a hemispherically contoured portion of the bottom.

3,598,271
COMBINATION DISPOSABLE CUP LID AND COASTER

Danforth Holley, Gross Pointe Shores, Mich., assignor to Holley Plastics Company, Warren, Mich.

Filed May 29, 1969, Ser. No. 828,987
Int. Cl. B65d *41/22, 23/06*
U.S. Cl. 215—41 **5 Claims**



A cup lid for use with disposable cups or the like, including a circular recess in the cup lid centrally thereof for receiving the bottom of a cup to permit vertical stacking of a plurality of cups having the cup lid thereon. The cup lid further includes an annular recess at the periphery thereof, including indentations spaced angularly thereabout on the exterior thereof and extending for part of the depth of the annular recess for locking the top of a cup within the annular recess. A hat-shaped section is provided between the circular recess and annular recess of the lid for receiving the bottom of a corresponding disposable cup with the lid inverted and used as a coaster. The circular recess may be provided with an offset portion adjacent the bottom thereof to provide a reduced diameter bottom section for snugly receiving the bottom of a corresponding cup with the lid in use as a cup holder. Angularly spaced apart radially extending ridges are provided between the hat-shaped section and the annular recess to provide lid strength and inhibit fluid movement around the lid and angularly spaced apart axially extending ribs are provided on the hat-shaped section to further space a portion of the hat-shaped section from a cup bottom position therein, thereby providing a cool gripping surface for the lid in use as a cup holder.

3,598,272
SELF-OPENING BOTTLE CAPS

Jose A. Bustamante, Agua 868 Jardines del Pedregal, Mexico City, 20, and Joaquin Iturriaga, Cerro de Sta. Isabel 123, Frac. Campestre Churubusco, Mexico City, 21, both of, Mexico

Filed June 17, 1969, Ser. No. 834,109
Claims priority, application Mexico, July 24, 1968, Aug. 9, 1968, Aug. 12, 1968, May 8, 1969, 104,773;105,127;105,187;110,989
Int. Cl. B65d *43/02*
U.S. Cl. 215—46 A **4 Claims**

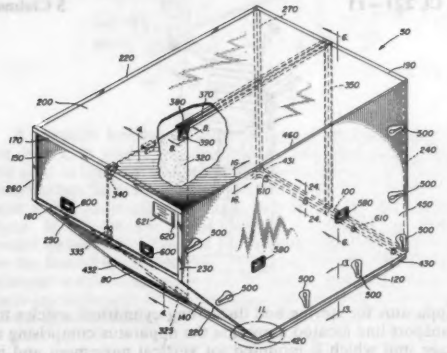
A self-opening bottle cap with a central depression defined by a raised peripheral ridge over the bead of the bottle that has a narrow U-shaped or V-shaped tab extending across the greater part of its upper surface and joined to the remainder of the upper surface, and to the skirt on each side by partially

cut lines of increased weakness in the metal of the cap. The ridge is flattened when applied to the bead. When the cap is to be removed this weakened strip is either peeled off by means of a rotatable key or pulled off by means of a ring, the key or the ring having been previously riveted to one end of the removable tab. The key is pivotable in the horizontal plane. The cap will then spring partly open of its own accord and can be completely removed by the fingers of one hand without the use of any other tool.

3,598,273
CONTAINER

Blase C. Rau, Skokie; John M. Buday, Park Ridge; Donald W. Feddersen, Northbrook, and Everett L. Markowski, Morton Grove, all of, Ill., assignors to Air Cargo Equipment Corporation, Tulsa, Okla.

Filed Dec. 6, 1968, Ser. No. 781,859
Int. Cl. B65d *87/00*
U.S. Cl. 220—1.5 **16 Claims**

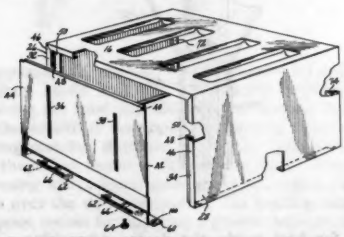


There is disclosed a container adapted to be carried in an airplane and used to transport either cargo or baggage, the container comprising a plurality of panels, a plurality of frame members removably interconnecting the panels, each of the panels including a pair of spaced-apart sheet metal walls and a body of rigid cellular construction therebetween, a rigidifying panel and a set of stiffeners removably mounted in the container, a door removably mounted in the container by means of a hinge mechanism, a plurality of latching mechanisms in the door for engaging keeper structure in the container and being constructed to prevent inadvertent opening and subsequent removal of the door, handles housed by the door for removing the door from the container and including venting ports, a bumper mounted on the base panel of the container and extending therearound to protect the container from damage, and removable shelves in the container separated one from the other.

3,598,274
ELECTRIC TOASTER CONSTRUCTION

Paul V. Snyder, Whitehall, Pa., assignor to General Electric Company

Filed July 25, 1969, Ser. No. 844,938
Int. Cl. B65d *7/30;* **A47j** *37/08*
U.S. Cl. 220—4 R **4 Claims**

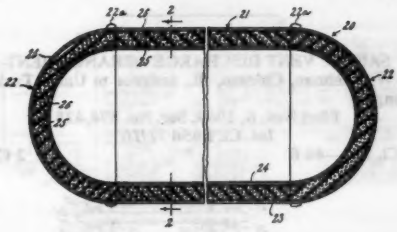


An electric toaster construction wherein a one-piece toaster shell includes top and sidewalls and also includes uniquely formed flanges for securely holding separate front and rear panels.

3,598,275
RADIAL-FILAMENT CYLINDERS

Edgar Francois, Wayne, N.J., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 21, 1969, Ser. No. 826,649
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 A **10 Claims**

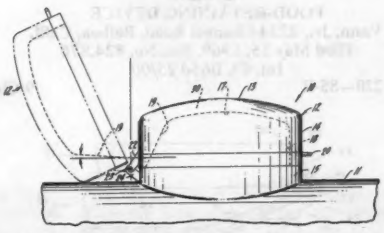


Hollow cylindrical bodies, the walls of which include a shell construction made of resin reinforced by short length, high modulus filaments extending substantially normal to the inner and outer shell surfaces, i.e. generally radially, are disclosed. The body wall may be composed of a single such shell reinforced by internal coaxial stiffening rings distributed along its length, or it may be composed of a sandwich structure consisting of a pair of identically constructed concentric shells with a low density core confined therebetween. Such bodies, when closed at their opposite ends by means of end caps, are particularly suited for use as deep submergence vessels, being characterized by high resistance to external hydrostatic pressures, a low weight-to-displacement ratio, and high compressive strength and elastic stability. Various methods of constructing such bodies are also disclosed.

3,598,276
SELF-DRAINING HOUSING AND MANWAY COVER

Fred Brown, Chicago, Ill., assignor to Union Tank Car Company

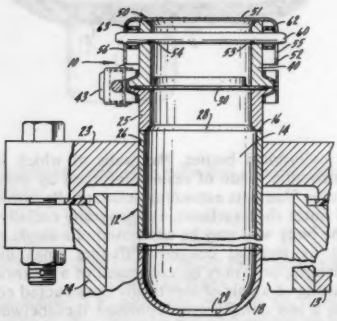
Filed Dec. 3, 1969, Ser. No. 881,778
Int. Cl. B65d *43/16, 51/10*
U.S. Cl. 220—31 **5 Claims**



A cover assembly for a manway in railway tank cars. The invention provides a cover pivotally mounted to a manway on a tank car so as to permit the cover to assume an open

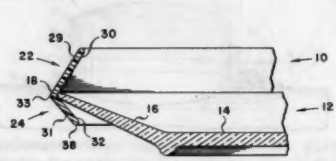
and closed position. The cover being of generally inverted U-shaped diametrical or rectangular cross section having a top portion and a side portion extending around the outer periphery of the top portion. The cover when in its closed position is located on one side of a vertical plane passing through the pivotal mounting and when in its opened position is located on the other side of the vertical plane. The cover includes an inner shell and an outer shell. The outer shell has a top portion and a side portion generally perpendicular to and disposed about the outer periphery of the top portion. The inner shell has a top portion substantially parallel to the outer shell top portion and a side portion having a lower section, located near the pivotal mounting, that inclines downward to the horizontal independent of the position of the cover, thereby preventing accumulation of liquid within the cover.

3,598,277
SAFETY VENT DISCHARGE ARRANGEMENT
John W. Adelman, Chicago, Ill., assignor to Union Tank Car Company
Filed Nov. 6, 1969, Ser. No. 874,425
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **2 Claims**



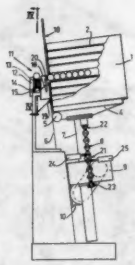
A safety vent structure for pressure vessels. A body defines a chamber having first and second openings, the latter communicating with an opening in the vessel. Associated with the first opening is a seat member adapted to receive a frangible element in closing relationship to the first opening. A retainer ring, secured to the seat member, serves to hold the frangible element against the seat. A closure cap is supported exteriorly of theretainer ring by a horizontal pin passing through apertures in the retainer ring and vertical slots in the closure cap. The closure cap rises when the escaping commodity makes contact therewith and permits flow to atmosphere. When the pressure within the chamber is reduced to approximately atmospheric pressure, the closure cap will automatically lower itself and close off the opening in the vessel.

3,598,278
FOOD-RETAINING DEVICE
John C. Vann, Jr., 2234 Channel Road, Balboa, Calif.
Filed May 15, 1969, Ser. No. 824,876
Int. Cl. B65d *25/00*
U.S. Cl. 220—85-R **9 Claims**



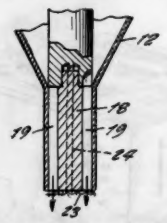
A food-retaining device adapted for removable mounting to an ordinary food plate. The device comprises a split ring shaped singular piece of flexible material having a substantially V-shaped cross section, adapted to receive and be mounted upon a food plate which is equal to or slightly larger in diameter than the diameter of the device itself. Mounting of the retainer device upon a plate is accomplished via a twisting and/or prying action exerted upon the ends of the split ring and thereupon inserting of the plate therein. When mounted circumferentially around a plate, the upper section of the retainer is disposed such that it slants upwardly and inwardly toward the center of the plate so that the inner surface thereof acts as a barrier to food which is urged against it, and thus prevents spilling of the food over the edge of the plate or the retainer device itself.

3,598,279
APPARATUS FOR THE STORAGE AND DISTRIBUTION OF CYLINDRICAL ARTICLES
Georges Duffau, Bordeaux-Cauderan, France, assignor to Societe De Conditionnement En Aluminium, Paris, France
Filed Aug. 6, 1969, Ser. No. 847,836
Claims priority, application France, Mar. 25, 1969, 6908650
Int. Cl. G07f *11/12*
U.S. Cl. 221—11 **5 Claims**



Apparatus for storing and dispensing cylindrical articles to a transport line located alongside the apparatus comprising a storage unit which is mounted for vertical movement and is provided with a plurality of horizontally disposed vertically spaced shelves which are inclined towards the transport line and a transfer unit located between the shelves and the transport line having a member mounted for vertical movement between blocking and unblocking position with the member blocking the exit from the aligned shelf when in blocking position and freeing the exit when in unblocking position to permit transfer of an object from the shelf onto the surface thereof and which is adapted to effect transfer of said object from the surface thereof when the adjacent portion of the transport line is free, and means controlling vertical movement of the shelves responsive to the absence of an object on a shelf aligned with the transfer unit, said means being responsive to contacts to reverse the movement of the shelf when in its upper position and in its lower position and to control shelf movement by an increment corresponding to the spaced relationship between the shelves in the absence of an article on the aligned shelf.

3,598,280
SEED HILLER
Ross Hukill, Box 346, Scottsbluff, Nebr.
Filed July 30, 1969, Ser. No. 846,081
Int. Cl. B23q *7/12*
U.S. Cl. 221—167 **1 Claim**



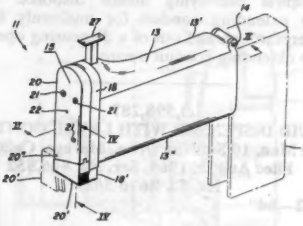
A planter for beet seeds, the device comprising a unit wherein the seeds are discharged from a pair of parallel and vertically extending chutes, and wherein the seeds are di-

vided at the top end of the chutes so as to be properly dispensed upon the ground.

3,598,281
PORTABLE LOADING MECHANISM FOR HEMOSTASIS CLIPS

Michael J. Watermeier, Memphis, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Sept. 18, 1969, Ser. No. 859,037
Int. Cl. B65h *5/00*
U.S. Cl. 221—198 **4 Claims**

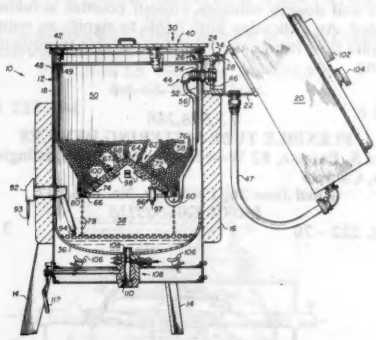


A portable loading mechanism for use by nurses, doctors, or others, to load applicator forceps with hemostasis clips to be used in tying off blood vessels during surgery. The loading mechanism includes a base adapted to be held in the hand and a clip-receiving head mounted on top of the handgrip base. In the interior of the base is a magazine mechanism which delivers the clips one at a time to a preloading position in the head from where they are pushed by a finger-operated plunger mechanism to the bell-shaped mouth of the head for delivery to the end of the applicator forceps which are placed in the delivery mouth.

3,598,282
APPARATUS FOR MELTING AND FEEDING SOLIDIFIED MATERIAL

Henry A. Phillips, 1340 New Brunswick Ave., Piscataway, N.J., and Reynold E. Minnich, 1309 Washington Valley Road, Martinsville, N.J.

Filed Nov. 25, 1969, Ser. No. 879,677
Int. Cl. B67d *5/62*; **F27b** *14/06*
U.S. Cl. 222—146 HE **18 Claims**

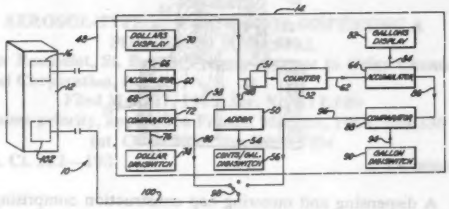


Apparatus for melting solidified material and feeding the resultant liquid including a vertically disposed hopper for receiving the solidified material and heating means for melting the solidified material. The heating means comprises a heating member disposed across the bottom of the hopper and shaped to promote flow of the liquid towards its outer perimeter where liquid passage means receive the liquid as it flows over the outer perimeter. The heating means may also comprise means for applying a greater amount of heat to the lower portion of the heating member disposed adjacent the liquid passage means than to the remaining top portion of the heating member to promote liquid flow along the upper surface of the heating member and prevent liquid flow along paths through the solid material.

3,598,283
GASOLINE PUMP COMPUTER

Ronald L. Krutz, Irwin, and Thomas J. Villella, New Kensington, both of, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 14, 1969, Ser. No. 815,838
Int. Cl. B65d *5/30*
U.S. Cl. 222—14 **14 Claims**

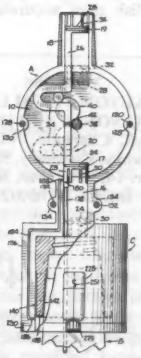


A solid-state binary coded decimal computer for use in modifying existing consumer marketing gasoline pumps so that the pump will automatically stop after dispensing either a preset number of gallons or a preset money value of gasoline.

3,598,284
DRINK METERING AND INDICATING DEVICE FROM A BEVERAGE BOTTLE

Frank L. Wessely, 360 W. 45th St., New York, N.Y.

Filed July 7, 1969, Ser. No. 839,291
Int. Cl. B67d *5/22*
U.S. Cl. 222—38 **9 Claims**

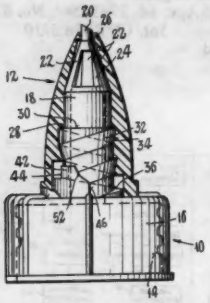


This invention relates to a device for metering and indicating individual drinks dispensed from a beverage bottle comprising a housing having an inlet and an outlet, a U-shaped member carrying valves for said inlet and outlet activatable by an operating shaft through pin means sliding in the U-shaped portion, means for releasably locking an operating cover to said operating shaft, ratchet means for indexing a numbering wheel, and locking means for preventing unauthorized removal of the device from the neck of a bottle.

3,598,285
CAPTIVE DISPENSING AND METERING CAP

Morton B. Stull, c/o Stull Engraving Co. 2132 81st Gulf, Marathon, Fla.

Filed Nov. 14, 1969, Ser. No. 876,834
Int. Cl. B67d 5/22
U.S. Cl. 222—48 7 Claims

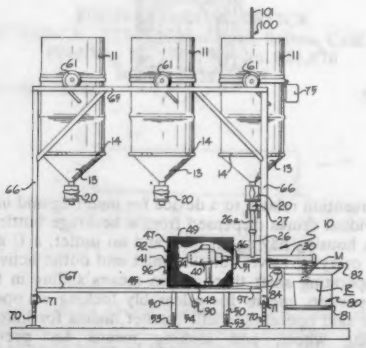


A dispensing and metering cap construction comprising a threaded tubular spoutlike cap body and an orifice-type screw cap both of molded plastic composition. In addition to the screw threads on the cap and cap body, the cap has a stop lug which is especially arranged to constitute a cam follower whereby it also serves somewhat like a thread element adapted to engage a cam track at the base of the cap body. Both the screw threads and the cam track and follower lug serve to raise the cap on the cap body in response to unscrewing movement. The extent of unscrewing determines the size of the opening of the discharge orifice in the cap. The cam track constitutes a positive or nonyielding lead means for the cap, whereas the screw threads are yieldable and impositive. Thus the cam track is the dominating one of the two lead means. By providing a hump or depression in the cam track, an accurate raised axial position of the cap can be readily effected for a given rotative position, without requiring an accurate corresponding relative positioning of the screw threads, since the latter can be made to yield a lesser or a greater amount under the influence of the cam track. The provision of the hump or depression thus can be used to attain an accurate metering position of the cap, and is easier to accomplish than accurate reorientation of the screw threads.

3,598,286
APPARATUS FOR AUTOMATICALLY AND UNIFORMLY FEEDING NONLIQUID MATERIAL

Winnifred A. Wardell, Charlotte, N.C., assignor to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Apr. 14, 1969, Ser. No. 815,868
Int. Cl. B67d 5/22
U.S. Cl. 222—51 7 Claims

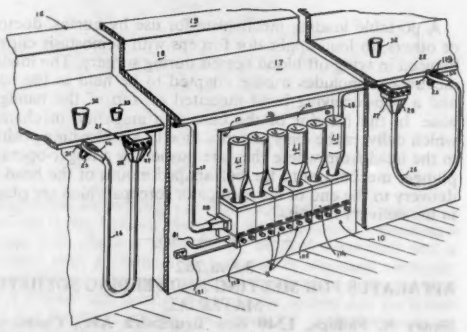


Apparatus for automatically and uniformly feeding powder, crystalline, paste, pellet and the like nonliquid material directly from the container in which the material is shipped or other container and characterized by being substantially air and moisture tight to prevent damage to the material being fed and by having components thereof detachably secured together for ease in assembly and disassembly and including an improved float gauge means therefor. The apparatus broadly comprises a hopper means attached to the open bottom end of the container of material, vertically extending valve means attached to the bottom of the hopper means, vertically extending conduit means detachably secured to the bottom of the valve means, horizontally extending conduit means secured to the bottom of the vertically extending conduit means, and driven variable-speed spiral conveying means disposed within the horizontally extending conduit for uniformly feeding the material therethrough and out of a dispensing opening in the horizontally extending conduit means.

3,598,287
LIQUID DISPENSER WITH LEVEL CONTROL

Heiko T. de Man, 10 Sullivan Drive, Moraga, Calif.

Filed Aug. 1, 1969, Ser. No. 846,852
Int. Cl. B67d 5/08
U.S. Cl. 222—64 7 Claims

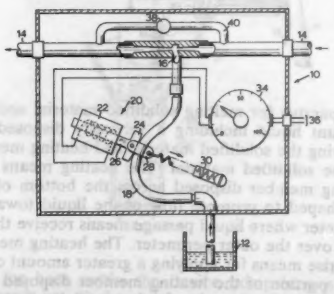


Apparatus for dispensing in discrete, measured volumes liquid from a bottle inverted in a reservoir and connected with a pair of compressed-gas-operated pumps supplies liquid to one or more dispensing faucets. Pump delivery volumes may be varied. A control circuit insures delivery of the selected full volume with each pump stroke recorded on a counter and double volumes without counter actuations are precluded. An indicating bulb lights to signify an empty bottle. Liquid flow rate to the faucet is variable to obviate liquid splashing.

3,598,288
FLEXIBLE TUBE-METERING DEVICES

Edward S. Posgate, 82 West Deane Park Drive, Islington, Ontario, Canada

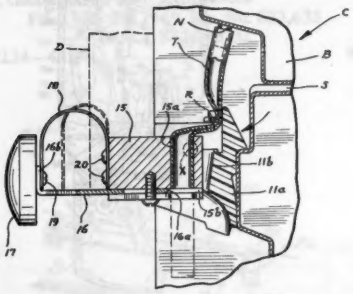
Filed June 26, 1969, Ser. No. 836,887
Int. Cl. G04c 23/38
U.S. Cl. 222—70 3 Claims



A fluid-metering device for injecting measured quantities of additive liquids into hydraulic systems and characterized

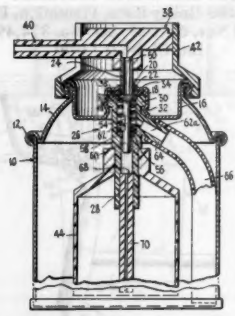
by a length of flexible tubing, with means for bending the tubing so that it acts as a shutoff valve or a variable flow rate valve.

3,598,289
DISPENSING TUBE VALVE WITH CUTTER
Lannie F. Norris, Hot Springs, Ark., assignor to Norris Dispensers, Inc., Minneapolis, Minn.
Filed June 19, 1969, Ser. No. 834,739
Int. Cl. B67b *7/30*
U.S. Cl. 222—80 **5 Claims**



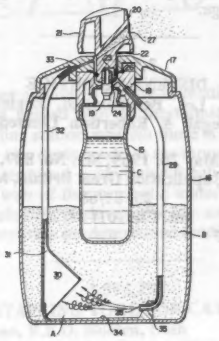
In the art of flexible, originally closed, dispensing tubes controlled by a pinchcock valve mechanism, such as are employed in refrigerated bulk drink dispensers, a quickly attachable cutting device having a body which is readily connectable with certain elements of the overall pinchcock valve mechanism. In its preferred form the body of the cutting device (after removal of the swingable pinchcock valve body from its seat), temporarily replaces the valve body and thereby positions a movable cutter element in a predetermined relation closely below the normal valve-pinch area of the dispensing tube. The structure of this invention positively prevents irregular severing of dispensing tubes far below the pinchcock seat, which often occurs in the usual operation of bulk milk and other liquid dispensers.

3,598,290
MIXING TYPE LIQUID DISPENSER WITH CAPILLARY DIP TUBE
Wolf Steiman, Fairfield, Conn., assignor to Valve Corporation of America, Bridgeport, Conn.
Filed June 13, 1969, Ser. No. 832,939
Int. Cl. B65d *35/24*
U.S. Cl. 222—94 **4 Claims**



A dispenser comprising a can containing pressurized liquid and having a valve to control the discharge. Connected with the valve and disposed inside the can is a second valve and a collapsible container, the latter having flexible walls and a watery product therein such as hydrogen peroxide which is pressurized due to the pressure existing against the flexible container walls. The second valve controls the outflow of the watery product from the container as effected by the pressure against the walls thereof. In this environment the invention provides, within the said container and connected to the second valve, a capillary tube constituting a discharge passage. The capillary tube may constitute a dip tube, and has the effect of smoothing out the rate of discharge of the watery product from the container under conditions of different pressures.

3,598,291
AEROSOL-TYPE DISPENSER FOR DISPENSING A POWDERED MATERIAL
Felix Rousselot, St. Benoit, France, assignor to Geigy Chemical Corporation, Ardsley, N.Y.
Filed Mar. 27, 1969, Ser. No. 811,109
Claims priority, application France, Mar. 29, 1968, 146,330
Int. Cl. B65d *83/14;* **B05b** *7/04*
U.S. Cl. 222—193 **2 Claims**

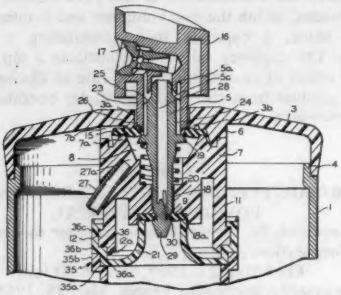


An aerosol-type dispenser for dispensing a powdered material. The dispenser comprises a propellant container, valve means operatively associated with said propellant container for controlling release of propellant from said propellant container, and a product container for containing the powdered material to be dispensed. A propellant intake tube extends from said valve means into the lower part of said product container and has at least one opening at the end thereof opening out near the bottom of said product container. A discharge tube extends from near the bottom of said product container and out of the product container. A fluidization chamber is provided between said tubes and powder from the product container is fluidized and in said fluidization chamber by flow of propellant therethrough.

3,598,292
AEROSOL DISPENSER WITH PLASTIC PROPELLANT CARTRIDGE
Joseph W. Kiliany, Prospect, Conn., assignor to Geigy Chemical Corporation, Greenburgh, N.Y.
Filed June 12, 1969, Ser. No. 832,660
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **3 Claims**

An aerosol-type dispenser for fluent products. A cap for a container for a fluent product has a plug valve assembly de-

pending from the under surface of said cap. The plug valve assembly has a depending flange and a propellant cartridge of a different plastic material than said depending flange has



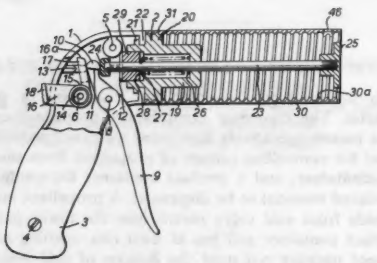
the open end thereof joined to the bottom of said flange with the plug valve assembly sealing the said open end of said propellant cartridge.

3,598,293

DISPENSING DEVICE

Ronald H. D. F. Lee, Berkhamsted, England, assignor to Cooper, McDougall & Robertson Limited, Berkhamsted, England

Filed May 26, 1969, Ser. No. 827,738
Claims priority, application Great Britain, May 28, 1968, 25581/68
Int. Cl. G01f *11/22*
U.S. Cl. 222—327 **6 Claims**



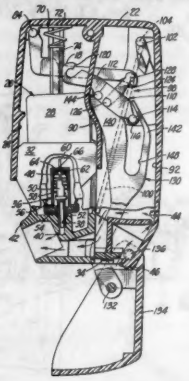
A device for dispensing liquid or semiliquid material from a screw-threaded cylindrical reservoir having a discharge opening and a piston, which device comprises a supporting structure having an actuating member arranged to move between two predetermined points to cause axial movement of said piston and the discharge of a dose of material from said reservoir. The device includes an operating member mounted on said supporting structure having an inoperative position and an actuated position and the operating member is arranged to impart movement to said actuating member between the said predetermined points. The device is provided with a member for locking the operating member in said actuated position.

3,598,294

INHALATION-RESPONSIVE AEROSOL DISPENSER

Nathan D. Hedrick, Granada Hills; Albert M. Hughes, Jr., Calabasas; Paul B. McKeehan, Canoga Park, and Charles G. Thiel, Chatsworth, all of, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 13, 1969, Ser. No. 876,263
Int. Cl. B65d *83/06*
U.S. Cl. 222—402.2 **10 Claims**



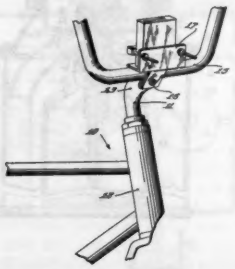
An inhalation-responsive medicament dispenser provided with a housing having therein an aerosol-dispensing device comprising a container equipped with a metering valve spring biased outwardly toward a charging position and movable inwardly into a discharging position. A main spring engages the housing and the aerosol container to bias the metering valve toward its discharging position. A charging lever opposes the action of the main spring to enable the container to move to a position permitting the metering valve to occupy its charging position, and a latch releasably retains the charging lever in a position corresponding to the charging position of the metering valve. An inhalation-responsive vane releases the latch, upon inhalation by the patient through a mouthpiece with which the dispenser is equipped, whereupon the main spring moves the container into a position corresponding to the discharging position of the metering valve, the latter then discharging a metered amount of medicament from the aerosol container into the mouthpiece for inhalation by the patient. Pivotally connected to the housing is a cover which encloses the mouthpiece when the dispenser is not in use. An actuating cam pivotally connected to the cover, and responsive to closing movement thereof, sets the charging lever, the latch and the vane in positions corresponding to the charging position of the metering valve. Subsequently, the cover may be opened so that the patient may inhale through the mouthpiece to obtain a metered amount of medicament in the manner previously recited.

3,598,295

BICYCLE RADIO BRACKET

Herbert Seegers, 480 Holley Lane, Plantation, Fla.

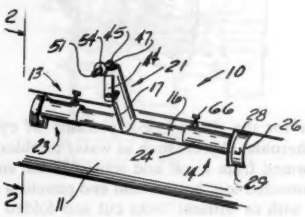
Filed Nov. 6, 1969, Ser. No. 874,497
Int. Cl. B62j *11/00*
U.S. Cl. 224—41 **3 Claims**



An accessory bracket for bicycles which is attachable to the hub joint between the steering column and the han-

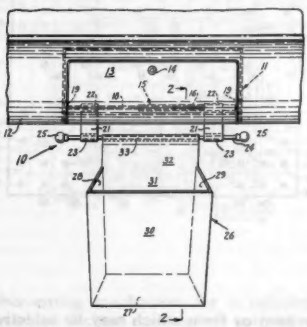
dlebars and which includes an L-shaped bracket having one leg thereof disposed parallel with the ground and the other disposed vertically with an adjustable enclampment member operatively carried by the vertical leg. A scuff-resistant coating is placed on the top of the horizontal member and on the opposed faces of the enclampment member and the vertical leg. The enclampment member and the vertical leg are so disposed towards one another that a radio resting atop the horizontal leg can be enclamped therebetween for stability. This allows a radio to be detachably attached to the bicycle.

3,598,296
UNIVERSAL WHEEL CARRIER APPARATUS
Frank T. Gostomski, Wahoo, Nebr. 68066
Filed May 12, 1969, Ser. No. 823,633
Int. Cl. B62d *43/02*
U.S. Cl. 224—42.06 **9 Claims**



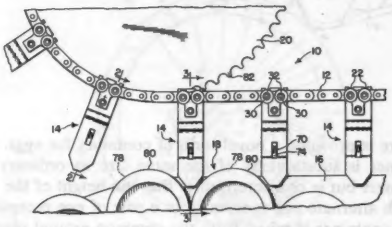
This invention relates to an apparatus for mounting a spare tire and wheel to the bumper of a vehicle, the apparatus comprising a shaft extending substantially parallel to the bumper and rotatably mounted to a pair of spaced apart mounting members, the members having a concave surface, thus being adapted to be fastened to the bumper; a support arm axially connected to the shaft and extending therefrom; a lock pin connected to the extended end of the arm and extending outwardly from the vehicle to lock the wheel; a bolt device for removably mounting the wheel to the arm, and a device reciprocally attached to the mounting members for maintaining the arm in a fixed position.

3,598,297
AUTOMOBILE LITTER BAG SUPPORT
Irene P. Welch, 2001 Maple Glen Road, Sacramento, Calif.
Filed Oct. 3, 1969, Ser. No. 863,628
Int. Cl. B60r *11/00*; **B65b** *67/12*
U.S. Cl. 224—42.46 R **1 Claim**



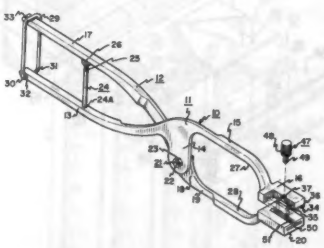
An automobile litter bag support having an adjustable horizontal support rod releasably mounted in the glove compartment of the vehicle supporting a pair of depending flexible straps which extend out of the bottom front edge of the glove compartment below the glove department door. The flexible straps support a transverse horizontal rod on which is mounted the back of the litter bag. The rod has a removable cap to prevent its being inadvertently detached from the flexible straps.

3,598,298
WEB CONVEYOR APPARATUS
Walter C. Diener, Oak Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Nov. 12, 1969, Ser. No. 875,880
Int. Cl. B65h *17/34*
U.S. Cl. 226—173 **4 Claims**



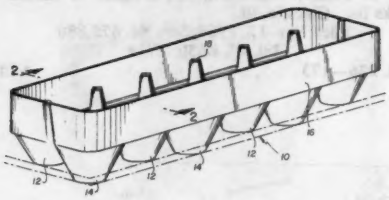
Web conveyor apparatus for use in feeding a generally vertically oriented heated web of thermoplastic material to a container molding station wherein there is provided a plurality of conveyor clip devices which are mounted for movement along a predetermined path immediately above the upper margin of the web of thermoplastic material, each conveyor clip device including positive gripping and release features which assure accurate predetermined feeding of the web.

3,598,299
STAPLING TOOL FOR CATTLE
Mark S. Johnson, R.F.D. Holden, Utah
Filed Jan. 2, 1970, Ser. No. 268
Int. Cl. B25c *5/02*
U.S. Cl. 227—144 **4 Claims**



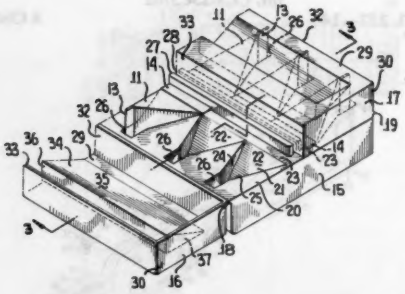
The present invention comprises a veterinary stapling tool or implement, and stapling means therefor, useful for maintaining the vagina of an animal in place during labor. The implement resembles a long-handled pliers, but includes a relief area for vagina tissue and, among other features, unique, spaced, nose or lip portions which are constructed to receive and subsequently release a unique staple assembly; the latter comprises a staple having a plate and also a corresponding, apertured plate over which the staple legs are crimped.

3,598,300
EGG CARTON
Henry B. Katz, 33 Westview Road, Short Hills, N.J.
Filed Oct. 31, 1969, Ser. No. 873,026
Int. Cl. B65d *1/00*
U.S. Cl. 229—2.5 5 Claims



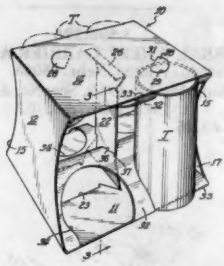
There is provided a novel form of container for eggs. This container is substantially of the same size as ordinary egg containers but is characterized in that the height of the base of each alternate egg receptacle in a row of egg receptacles in the container is raised from the common ground plane of the remaining receptacles in the container. This form of container reduces the risk of breakage of thin shelled, so called "jumbo" eggs, while retaining a size of container which is substantially the same as that utilized in the trade.

3,598,301
CARTON FOR TETRAHEDRAL PACKAGES
Fred B. Shaw, Hinsdale, and Florren E. Long, La Grange, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Mar. 5, 1969, Ser. No. 804,633
Int. Cl. B65d *1/36, 81/16, 85/30*
U.S. Cl. 229—15 10 Claims



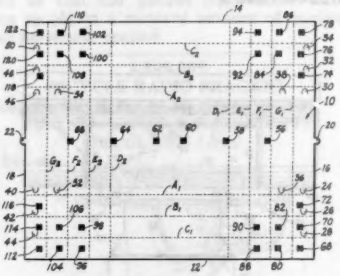
This disclosure relates to cartons for packaging a plurality of individual tetrahedral articles in such a manner as to protect the articles from damage during shipment and rough handling. The carton is provided with individual compartments which conform generally to the shape of the tetrahedral articles intended to be packaged and which serve to restrain the tetrahedral articles against relative movement. The carton closure flaps are further provided with wedge-shaped walls which are adapted, upon closure of the flaps, to press against a side of each tetrahedral article packaged within the carton thereby forming a tight package.

3,598,302
CARRIER FOR DISPLAY OF CYLINDRICAL OBJECTS, SUCH AS GLASS TUMBLERS, OR THE LIKE
William W. Nowak, Broadview Heights, Ohio, assignor to Container Corporation of America, Chicago, Ill.
Filed July 23, 1969, Ser. No. 844,033
Int. Cl. B65d *5/48, 71/00*
U.S. Cl. 229—28 R 6 Claims



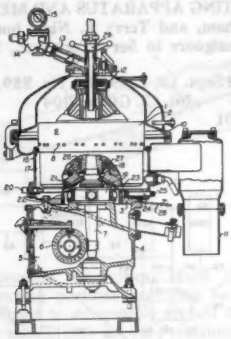
A carrier for the display of a plurality of cylindrical or oblately spheroidal objects such as water tumblers, the carrier being formed from a cut and scored blank and folded to provide connected top, bottom and end panels, a central support panel with or without locks cut and folded from either the top or bottom panel and secured to the other of such panels, locking flaps foldably extending from the sides of said top and bottom panels and having partly elliptical openings therein to receive the upper and lower ends of the tumblers, and adapted to be folded inward to occupy planes angularly related to the planes of the top and bottom panels while holding the tumblers in position, the distal portions of said flaps being preferably locked to the central locking panel.

3,598,303
VARIABLE SIZED BOX FORM
George W. Folz, 124 East 57th Place, Tulsa, Okla.
Filed Feb. 20, 1969, Ser. No. 801,012
Int. Cl. B65d *5/22*
U.S. Cl. 229—34 1 Claim



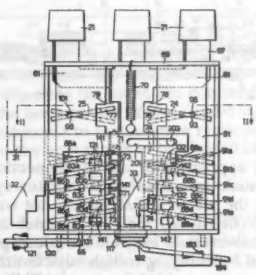
A base pattern or form which may be selectively folded and locked together in such a manner as to provide a great variety of sizes for a box. A combination of variable fold and cut or trim lines with tab and slot arrangements which provide a multiplicity of sizes in both lateral and transverse directions and in height for boxes or packaging device.

3,598,304
SEPARATOR STERILIZABLE BY SUPERHEATED STEAM
Heinrich Hemfort, Oelde, Westphalia, Germany, assignor to Westfalia Separator A.G., Westphalia, Germany
Filed Feb. 3, 1970, Ser. No. 8,260
Claims priority, application Germany, Feb. 28, 1969, P 19 10 211.5
Int. Cl. B01d *21/26*
U.S. Cl. 233—1 A **5 Claims**



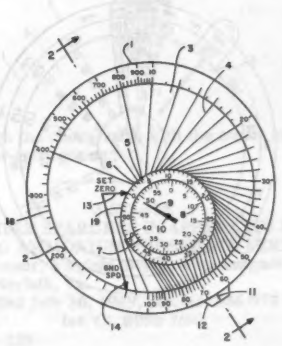
A centrifugal separator comprising a drum whose driving spindle is rotatably mounted in a frame, a casing surrounding the drum and attached to the frame, is provided with a sealing means between the frame or casing and the drum to prevent passage of steam used for sterilizing, from the casing to within the frame. The sealing means can be in sliding sealing engagement with the frame and can be moved axially upwardly so that the upper end thereof is placed in sealing engagement with a sealing ring on the drum.

3,598,305
NUMBER-SETTING MECHANISM FOR A CALCULATING AND SUCH MACHINES
Ettore Abbiati, Turin, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Turin, Italy
Filed May 1, 1969, Ser. No. 820,769
Claims priority, application Italy, May 4, 1968, 51532A68
Int. Cl. G06c *29/00*
U.S. Cl. 235—60 TK **17 Claims**



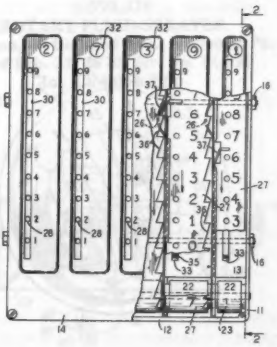
A number-setting mechanism for a calculating or like machine in which decimal numbers are entered comprising: a mechanical setting store with a plurality of decimal orders having in each order at least one settable member adapted to be set in a plurality of different positions, a pair of complementary stepped profiles adapted to be shifted variably according to the position which the settable member is to reach, a pair of reading elements for the stepped profiles movable for complementary strokes and two positioning members shiftable in opposite directions under the control of the reading elements to bring positively the settable member from any previously occupied position to the position to be reached, said stepped profiles being shifted under the control of at least an encoding device actuated by numerical keys.

3,598,306
TIME-SPEED-DISTANCE COMPUTER INSTRUMENT
Thomas Lawrence Osborne, 5 Spring Valley Drive, Holmdel, N.J.
Filed Feb. 2, 1970, Ser. No. 7,461
Int. Cl. G04b *37/12*; **G06c** *3/00*
U.S. Cl. 235—61 NV **10 Claims**



A time-speed-distance computer instrument is described which uses coupled logarithmic and linear scales and a continuously indicating clock mechanism to allow computation of travel time, estimated time of arrival, actual time of arrival, speed, elapsed time, distance traveled, current time, and other associated quantities, without reference to any other instrument or use of mental arithmetic, and without restriction on the magnitude of the variables.

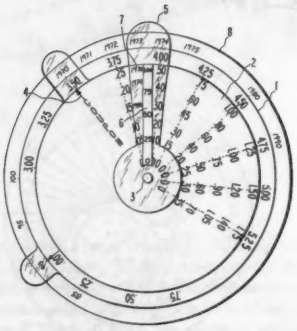
3,598,307
BELT-TYPE CALCULATOR WITH TRANSFER MECHANISM
Harry A. Burgess, 41 Coleman Ave. West, Chatham, N.J.
Filed Dec. 9, 1969, Ser. No. 883,572
Int. Cl. G06c *15/26, 27/00*
U.S. Cl. 235—71 R **10 Claims**



A belt-type adding machine has a transfer mechanism using teeth along the edge of a belt and a pawl on the ad-

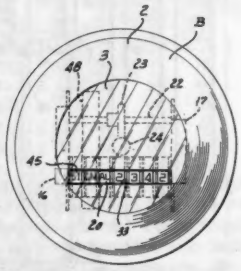
jacent belt for engaging a tooth on every tenth step and moving the belt one tooth space. The pawl moves into position on the ninth step. If it rests there, the teeth are free to move past it if necessary, due to resilient mounting of the pawl.

3,598,308
MEANS FOR CALCULATING MARKET YIELD ON DISCOUNT BONDS
Anthony F. Garcia, Jr., 241 Polhemus, Atherton, Calif.
Filed Feb. 24, 1969, Ser. No. 801,298
Int. Cl. G06c *3/00*
U.S. Cl. 235—88 **4 Claims**



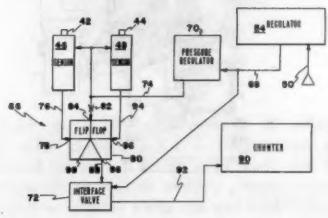
Means for calculating market yield on discount bonds comprising a graduated scale of numbers indicative of interest rates and a numerical table mounted for relative movement with respect to said scale. The table comprises a plurality of diverse, numerical scales indicative of differences between coupon and basic yield interest rates. A cursor having an index comprising a graduated series of numbers indicative of percentages is mounted for relative movement with respect to the graduated scale and table.

3,598,309
HUBODOMETER WITH RESETTABLE SIGNAL
Charles H. Engler, Murray Hill, and Robert Fulvio, Secauscus, both of, N.J., assignors to Engler Instrument Company, Jersey City, N.J.
Filed June 10, 1970, Ser. No. 45,031
Int. Cl. G01c *22/00;* **G01d** *21/00*
U.S. Cl. 235—95 B **10 Claims**



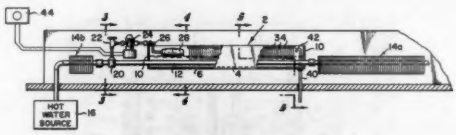
A closed casing adapted to be affixed to a rotatable element has a window and a registering mechanism inside the casing mounted to permit the casing to rotate around it having indicator wheels visible through said window, and drive means for said indicator wheels. A signal inside the casing is normally disposed in a first position and includes an element juxtaposed to said window and normally engaged with said drive means to move said signal in timed relation to the movement of said indicator wheels into a second signaling position. Said element is disengageable from said drive means by a force, for example, magnetism, applied externally of and through said window and is automatically reset to said normal first position.

3,598,310
COUNTING APPARATUS AND METHOD
Joseph P. Bingham, and Terry E. Nish, both of Salt Lake City, Utah, assignors to Servi-Tech Inc., Salt Lake City, Utah
Filed Sept. 18, 1969, Ser. No. 859,005
Int. Cl. G06m *7/04*
U.S. Cl. 235—201 **6 Claims**



Spaced fluidic sensors serially sense relatively moving containers, the first sensor being actuated to direct fluid pressure to a counter and the second sensor being actuated to divert fluid pressure away from the counter. The counter registers one-half count in response to the fluid pressure and another one-half count when the pressure is removed.

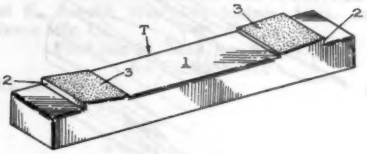
3,598,311
HUMIDIFYING APPARATUS
Robert F. Lauffenburger, 726 Cobham Park Road, Warren, Pa., and Edmund H. Waszkiewicz, Eielson Air Force Base 5010 Civil Engineering Squad, APO Seattle, Wash.
Filed Sept. 26, 1969, Ser. No. 861,243
Int. Cl. F24f *3/14*
U.S. Cl. 237—78 **3 Claims**



Humidifying apparatus for use in connection with a hot-water system such as a baseboard radiator system, characterized in that the means for supplying hot water to the hot water demand (i.e., load) includes a series-connected conduit section that extends longitudinally completely through an open-topped humidifying trough adjacent the bottom wall thereof. Means are provided for supplying liquid to a given level in the trough above the conduit section, and evaporator means supported by the sidewalls of the trough are partially submerged in the liquid, whereby the heat of the fluid supplied to the hot-water demand via the conduit section is used to heat the liquid in the trough for vaporization by said evaporator means. In accordance with one modification of the invention, the hot water demand comprises a first baseboard radiator element and the trough is arranged in heat exchange relationship vertically above an additional baseboard radiator element connected in parallel with the

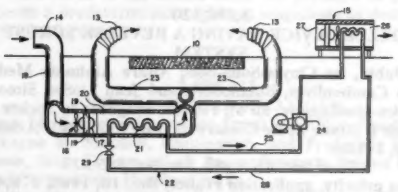
first radiator element, whereby the heat of convection of the additional radiator element assists in heating the liquid in the humidifier trough.

3,598,312
SYNTHETIC CROSSTIE
William R. Hamilton, Jr., Naperville, Ill., assignor to Portec, Inc., Chicago, Ill.
Filed Dec. 16, 1968, Ser. No. 783,895
Int. Cl. E01b *3/10, 3/44*
U.S. Cl. 238—29 **5 Claim**



A synthetic crosstie for railway track having integral canted rail-supporting portions and also having cross-sectional shapes adapted to adequately embed themselves into the ballast while taking into account minimum interference with ballast-tamping apparatus.

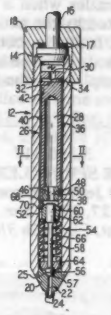
3,598,313
FOG REMOVAL AND PREVENTION METHOD UTILIZING COOL DRY AIR
Milton Plattner, Silver Spring, Md., assignor to Fairchild Hiller Corporation, Montgomery County, Md.
Filed Oct. 28, 1969, Ser. No. 871,842
Int. Cl. E01n *13/00*
U.S. Cl. 239—2 R **2 Claims**



A method for removing or preventing fog that includes taking ambient air into the confined area of a cooling chamber and subjecting the air in the confined area to cooling to reduce the temperature of the air and injecting the air that has been subjected to temperature reduction into the atmosphere above the area that is to be cleared of fog.

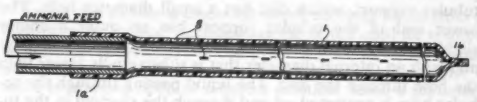
3,598,314
ACCUMULATOR-TYPE INJECTION VALVE
John M. Bailey, Dunlap; Waldemar A. Staniak, and Donald J. Waldman, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Continuation of application Ser. No. 680,824, Nov. 6, 1967, now abandoned. This application Jan. 30, 1970, Ser. No. 7,200
Int. Cl. F02m *41/16*
U.S. Cl. 239—96 **19 Claims**

An accumulator-type injector nozzle providing a case defining a valve chamber, an inwardly opening spring-loaded check valve being positioned within the chamber for controlling a fuel outlet, a sleeve defining a fuel accumulator chamber being positioned within the case to receive pressurized fuel having leaked behind the check valve, the sleeve also serving as an edge-type fuel filter, the sleeve further



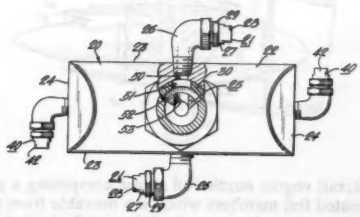
serving to align the check valve with the outlet and to adjust the load on the valve spring.

3,598,315
FLEXIBLE SPARGERS IN APPARATUS FOR PRODUCING AMMONIUM PHOSPHATE FERTILIZERS
James E. Seymour, Virginia Beach, Va., assignor to Royster Company, Norfolk, Va.
Filed July 30, 1969, Ser. No. 846,072
Int. Cl. B05b *3/00*
U.S. Cl. 239—229 **7 Claims**



Flexible sparging devices for distributing ammoniating liquids in apparatus for manufacturing ammonium phosphate fertilizer compositions comprising flexible tubing or hose with multiple escape apertures in the walls thereof. The tubing or hose is closed at the end opposite the inlet and at least the inlet end is secured to a fixed support. Such flexible sparging devices provide infinite loci of distribution due to propulsive force of ammonia ejection and the propensity of such spargers to move from areas of higher to lower fluid density.

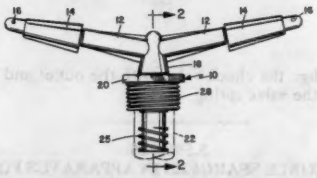
3,598,316
ROTARY FLUID-SPRAYER
Harold C. Johnson, 40 Linwood Ave., Ardmore, Pa.
Filed Feb. 25, 1970, Ser. No. 14,020
Int. Cl. B05b *3/06*
U.S. Cl. 239—251 **9 Claims**



A rotary spray head is disclosed for effecting a washing action on inside surfaces of enclosures or for washing dust from gas or air streams. The head comprises a body mounted for

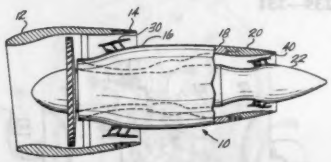
rotation on a spindle and driven by reaction forces created by the effluence of fluid from nozzles on the body. The rotational velocity of the body is controlled by means of control nozzles mounted on the body to issue fluid in a direction counter to the drive nozzles when a free ball mounted in a valve chamber is unseated by the action of centrifugal forces and fluid is discharged from the control nozzles. The rotational velocity of the body may be adjusted by varying the pressure of the fluid supplied to the head or by altering the dimensions of the nozzles and the ball.

3,598,317
ROTATABLE SPRINKLER ASSEMBLY
James C. Roberts, 1860 Jeffrey, Escondido, Calif.
Filed Feb. 27, 1970, Ser. No. 14,959
Int. Cl. B05b *3/06*
U.S. Cl. 239—251 **9 Claims**



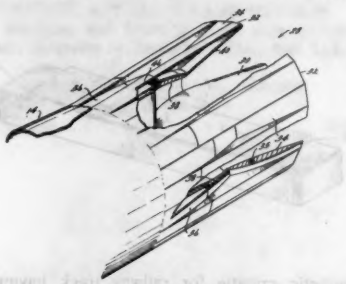
A sprinkler head that is rotated by liquid pressure passing through the head, which sprinkler head has a tubular support inserted in a tubular base for rotational movement on a bearing positioned therebetween. The tubular base has a disc positioned therein immediately adjacent the lower end of the tubular support, which disc has a small diameter hole. The lower end of the tubular support has an outer diameter slightly smaller than the inner diameter of the tubular base and with an internal diameter that is substantially larger than the hole through the disc. The liquid passing through the tubular base is projected up and through the channel in the tubular support and is restricted from passing between the tubular support and the tubular base, thereby restricting the depositing of impurities from the liquid into the bearing. The wall of the lower end of the tubular support has impeller means that upon rotation pulls liquid through the tubular support to the sprinkler head and pulls liquid away from the bearing.

3,598,318
MOVABLE ACOUSTIC SPLITTER FOR NOZZLE AREA CONTROL AND THRUST REVERSAL
Theodor J. Schiel, Cornelius, Oreg., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 10, 1970, Ser. No. 27,274
Int. Cl. B64d *33/04*
U.S. Cl. 239—265.13 **9 Claims**



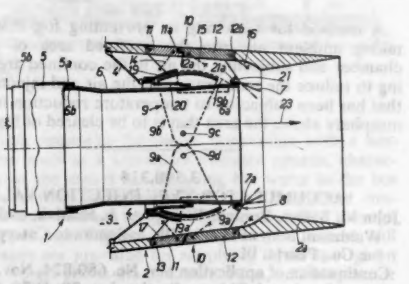
An aircraft engine nozzle foil means comprising a plurality of segmented foil members which are movable from a cruise or stowed position along a wall of the nozzle duct at the exit plane to a first position well forward of the exit plane within the duct to split the flow of acoustic attenuation and to increase the nozzle passageway exit plane area for low speed flight. The foil members are movable to a second operative position wherein they block the nozzle flow to divert exhaust gases through a lateral passageway through the outer cowl which is opened by a translating aft portion of the cowl.

3,598,319
PROPULSION NOZZLES
Werner E. Howald, and Elmore Verne Sprunger, both of Cincinnati, Ohio, assignors to General Electric Co.
Filed July 14, 1969, Ser. No. 841,247
Int. Cl. B63h *11/10*
U.S. Cl. 239—265.19 **24 Claims**



The disclosure shows a propulsion nozzle having angularly spaced afterbodies projecting downstream of the convergent portion of the nozzle. Secondary flaps are pivotally mounted between the afterbodies, forming, in combination therewith, a divergent nozzle portion for maximum supersonic exhaust gas velocities. The flaps are pivoted inwardly to aerodynamically reduce the nozzle exit area for reduced exhaust gas velocities, particularly for subsonic flight. The flaps may be pivoted further inwardly against a central plug to block rearward gas flow and produce reverse thrust. The pivotal mountings of the flaps form a structural hoop, and the actuators for the flaps are mounted within the afterbodies. Alternate forms of flaps and hoop means are shown as well as features of cooling air conservation.

3,598,320
NOZZLE DEVICE HAVING A REVERSE THRUST SYSTEM
Rene Babin, les Clayes-Sous-Bois; Andre Alphonse Mederic Leon Camboulives, Billancourt, and Jean Lucien Simonin, Issy-les-Moulineaux, all of, France, assignors to Societe Nationale D-Etude Et De Construction De Moteurs D'Aviation, Paris, France
Filed Dec. 15, 1969, Ser. No. 885,219
Claims priority, application France, Dec. 16, 1968, 178,414
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.25 **7 Claims**



A jet engine nozzle device comprising a primary nozzle system, a fairing surrounding said primary nozzle system and defining in relation thereto an annular duct for flow of air, and a thrust-reversing system carried by the fairing and constituted by reverse thrust obstacles adapted to be displaced into an operative position in which they are disposed in the path of the hot gases flowing through said primary nozzle

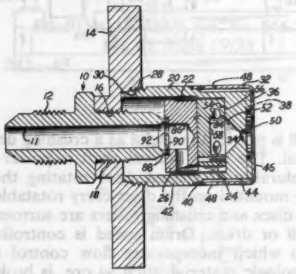
system and thus deflect said gases towards openings distributed over the wall of the fairing, the primary nozzle system comprising at the rear a movable jet pipe section having a rear edge which is normally located to the rear of the thrust-reversing system, while means are provided to displace said movable jet pipe section forwardly in order to permit said obstacles to move into their positions for reverse thrust and deflect the hot gases towards said openings, which are associated with obturating elements which uncover them in the reverse thrust condition and form walls of ducts which channel the thus deflected hot gases across said annular duct.

3,598,321

LEAF SPRING NOZZLE FLOW CONTROL

Darrel G. Bobzin, West Des Moines, Iowa, assignor to Delavan Mfg. Co.

Filed Jan. 31, 1969, Ser. No. 795,642
Int. Cl. B05b 7/10
U.S. Cl. 239—400 18 Claims



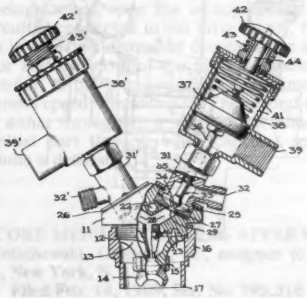
A leaf spring nozzle flow control which is positioned in the nozzle body controls the flow of fluid to a fixed restriction nozzle such that the flow varies substantially in direct linear relationship with the pressure of the fluid. The flow control includes a plate having a plurality of leaf spring valves which are biased by the fluid pressure from a first position in which flow to the nozzle is blocked to a second position in which the fluid flows to the nozzle when the pressure of the fluid exceeds a predetermined minimum magnitude as determined by the leaf spring.

3,598,322

TWO-MATERIAL SPRAY GUN

Frank M. Rupert, Alexandria; Frank E. Miller, Huntingdon; Wayne R. Mitchell, Huntingdon, and Frederick E. Coffman, State College, all of, Pa., assignors to Prismo Universal Corporation, Huntingdon, Pa.

Continuation of application Ser. No. 634,275, Apr. 27, 1967, now abandoned. This application Feb. 27, 1970, Ser. No. 15,272
Int. Cl. B05b 7/00
U.S. Cl. 239—410 6 Claims



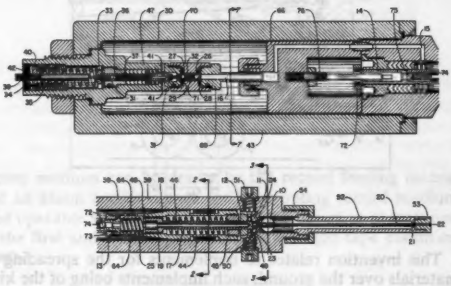
A spray gun for separately spraying two materials through the same fluid tip with the inputs controlled through separate air-controlled needle-type valves mounted at angles to each other on the body of the spray gun assembly with an additional input to the assembly for the atomizing air.

3,598,323

PRESSURE ACCUMULATOR

Douglas Johnston, and Harold Scott Parker, both of Decatur, Ala., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 22, 1969, Ser. No. 843,431
Int. Cl. B05b 1/30
U.S. Cl. 239—533 2 Claims



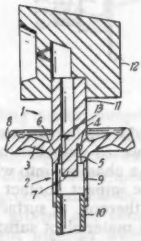
An ejector device is disclosed which receives liquid from a high-pressure source, accumulates the liquid until its volume is built up sufficiently to compress a portion thereof and, after taking up lost motion, a lifter spring, at which time a valve is snapped open to a detent position; when a predetermined volume of liquid has been discharged, a return spring snaps the valve shut to complete the cycle.

3,598,324

VALVE DEVICES

Richard Terence Macguire-Cooper, Navron House, St. Helens Ave., Benson, Oxfordshire, England

Filed Feb. 19, 1969, Ser. No. 800,402
Claims priority, application Great Britain, Feb. 19, 1968, May 14, 1968, 7913/68;22733/68
Int. Cl. B05b 1/32
U.S. Cl. 239—541 18 Claims



An aerosol valve device which is a single moulding including opposed, preferably annular, walls relatively movable from an abutting, valve closure, position to a position in which the valve device is open by applying a deforming force

to the moulding, the moulding also including a dip-tube or provision for the attachment of a dip-tube and a nozzle or provision for the attachment of a nozzle.

3,598,325

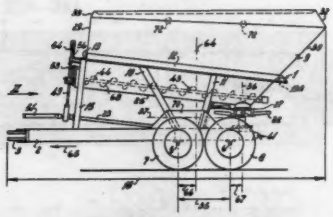
IMPLEMENTS FOR THE SPREADING OF MATERIALS OVER THE GROUND

Cornelis Van der Lely, Bruschenrain 7, Zug, Switzerland

Continuation of application Ser. No. 609,880, Jan. 17, 1967, now abandoned. This application Sept. 26, 1969, Ser. No. 861,516

Int. Cl. A01c *17/00*

U.S. Cl. 239—665 **11 Claims**



This invention relates to implements for the spreading of materials over the ground, such implements being of the kind comprising a frame supported by rotatable ground wheels, a hopper or other container for material to be spread and a distributor rotatable about a substantially vertical axis.

The distributor is located beneath the hopper but above the wheels so that material can be spread unimpeded laterally of the implement. An agitator in the hopper can be adjusted to move varying amounts of material towards the distributor. The distributor can be adjusted to vary the amount and direction of the material being spread.

3,598,326

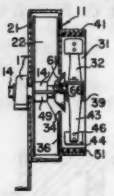
ORE GRINDING MECHANISM AND METHOD

Linus E. Pennell, 1341 Lamar St., Denver, Colo., and Harvey H. Onstott, 4801 E. 23rd Ave., Denver, Colo.

Filed Jan. 21, 1969, Ser. No. 792,453

Int. Cl. B02c *13/09, 13/288*

U.S. Cl. 241—19 **5 Claims**



A mechanism for reducing the size range of solid materials utilizing a motor powered impeller having a plurality of blades rotating within a chamber into which the solid materials are introduced for impact contact with the blades and wear plates disposed thereon. A surface of said chamber is covered with resilient material of substantial thickness with the clearance between said blades and plates and said resilient element being less than the initial size of the largest solid particles introduced. Reduced materials of regulated size as determined by adjustable exit passages are conveyed out of the mechanism by a fan unit. A method for the impact grinding of solids materials utilizing a resilient surface and an impacting element moving at relatively high speed past such surface and disposed at contact angles assuring interaction of impelled particles and the resilient surface.

3,598,327

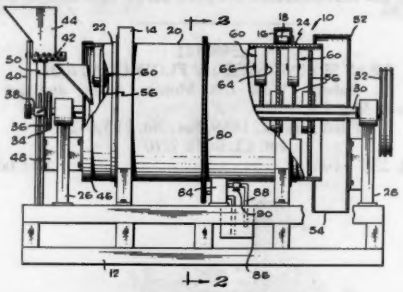
ROLLER MILL

John G. Brandes, 12160 Youngdale Ave., San Fernando, Calif.

Filed Mar. 20, 1969, Ser. No. 808,856

Int. Cl. B02c *15/08*

U.S. Cl. 241—33 **8 Claims**



The roller mill is principally useful as a crushing device for geologic material. The main central shaft is power rotated and carries a plurality of spaced discs rotating therewith. Arms swingably mounted on the discs carry rotatable crushing rollers. The discs and crushing rollers are surrounded by a rotatable shell or drum. Drum speed is controlled by a hydraulic pump which incorporates flow control to limit drum speed. Geologic material, such as ore, is broken to a manageable size and is fed into one end of the drum. Airflow or waterflow controls material flow rate through the drum and the central shaft speed controls the fineness of grinding as the crushing rollers are centrifugally engaged on the geologic material against the inner drum surface.

3,598,328

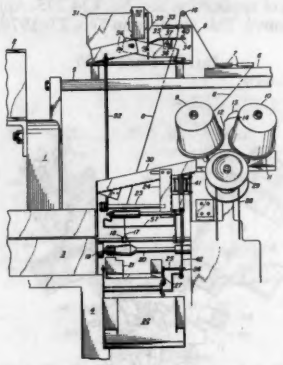
KNOT DETECTING AND REJECTING ATTACHMENTS FOR UNIFIL-TYPE BOBBIN WINDING MACHINES

Albert Joseph Richards, and Henry Eugene Gaillardetz, both of Lowell, Mass., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Mar. 19, 1970, Ser. No. 21,087

Int. Cl. B65h *54/14, 63/06*

U.S. Cl. 242—28 **4 Claims**



A bobbin-winding machine for automatic bobbin change looms of the "Unifil" type winds bobbins from a series of yarn packages, the end of one package being tied to the beginning of another so that winding continues without inter-

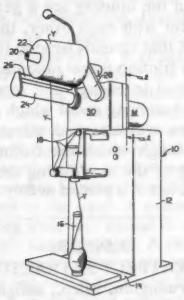
ruption. Wound bobbins are doffed when full by a doffing cycle, which stops winding, transfers the wound bobbin through a guide track into a magazine, cuts threads, and at the end of the cycle restarts winding. Knots are avoided by passing the yarn through an opening, such as a slot, large enough to pass yarn but smaller than a knot, so that when a knot passes the plate having the opening trips actuating switches to start a doffing cycle even through a bobbin is not completely wound and includes tilting of the guide track so that bobbins containing knots are fed into a separate magazine, from which they can be removed by hand, the knot cut off, and the bobbin introduced into the main magazine with the other wound bobbins. The end of the doffing cycle actuates the switches and resets the trip plate with its opening for yarn.

3,598,329

SPEED CONTROL MECHANISM FOR STRAND WINDING APPARATUS

Richard J. Savageau, Seneca, and Richard R. Pierce, Easley, both of, S.C., assignors to Maremont Corporation, Chicago, Ill.

Filed Oct. 15, 1969, Ser. No. 866,779
Int. Cl. B65h *59/38*
U.S. Cl. 242—45 **1 Claim**



A mechanism for selectively controlling the speed of a precision yarn winder or other strand winding apparatus so as to alternatively realize during a winding operation either constant yarn speed or constant takeup spindle speed, or constant spindle speed during any desired initial part of the operation and constant yarn speed during the remainder thereof. The mechanism also permits automatic termination of the winding operation when desired. The mechanism includes a drive-motor control circuit having a first subcircuit and second subcircuit alternately connectable with the variable speed drive motor of the winding apparatus. The first subcircuit includes a variable resistor and another resistor arranged in parallel relationship. During a winding operation, a mechanical linkage increases the resistance of the variable resistor in response to the increasing diameter of the strand package being formed upon the takeup spindle. When the first subcircuit is connected to the drive motor, the resulting increase in its effective resistance decreases the speed of the drive motor and therefore of the takeup spindle hyperbolically in relation to the increasing package diameter, so that constant strand speed is maintained. The second subcircuit is employed, either throughout a winding operation or during only an initial part thereof, when constant speed of the takeup spindle is desired.

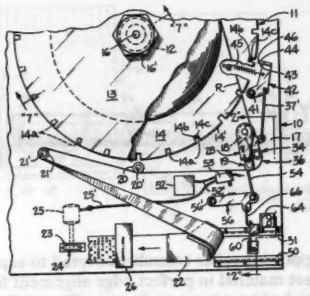
3,598,330

RECORD MEDIUM HANDLING APPARATUS

Paul O. Gotschewski, Glenview, Ill., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 14, 1969, Ser. No. 799,310
Int. Cl. B65h *75/02*
U.S. Cl. 242—55 **11 Claims**

There is disclosed record medium handling apparatus including a record medium supply reel, record feeding apparatus for drawing record medium off the supply reel through a first path, a device for preventing rotation of the supply reel while slack exists in the record medium in the first path, a second and alternate path through which a



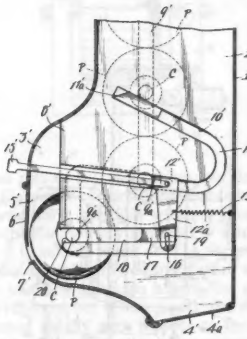
record medium can be drawn by the record feeding means, and an alarm and/or means for interrupting record medium feed operable when there is no record medium in at least one of the first and second paths, or when a tight-tape condition exists.

3,598,331

TOILET PAPER HOLDING DEVICE

Tadasu Okamura, No. 79, 2-Chome, Honcho, Kawaguchi, Saitama, Japan

Filed Dec. 17, 1969, Ser. No. 885,693
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 **2 Claims**



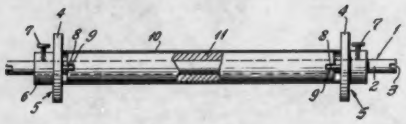
A toilet paper holding device comprising a housing, a pair of spaced guide members each having a paper roll core guide groove on the inner side and at least one pusher guide groove on the outer side, an elastic pusher member slidably received in said pusher guide groove, an elastic weir slidably received in said pusher guide groove and connected to said pusher member for movement together with the latter, said weir having a through bore adapted to communicate with said core guide groove, and a manual operation member connected to said pusher member for moving said through bore of the weir into and out of communication with the core guide groove whereby the core of a paper roll which is retained by the weir is freed from the holding action of the weir and fed into a service chamber and the core is retained by the weir.

3,598,332

WEB-SUPPORTING ROLLER ASSEMBLY

Melvin Sharkey, 1614 Hereford Road, Hewlett, Long Island, N.Y.

Filed Feb. 5, 1969, Ser. No. 796,654
Int. Cl. B65h 75/14
U.S. Cl. 242—71.8 5 Claims



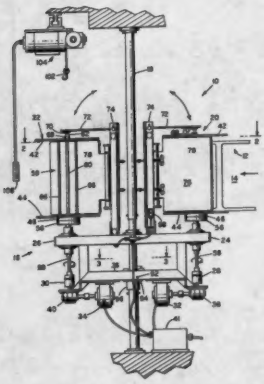
Web-supporting roller assembly adapted to support a wide web of sheet material in perfect edge alignment for transport through web-processing equipment. The roller assembly comprises a central shaft, a web-supporting cylindrical tube thereon, flanges adapted to make locking engagement with each end of said tube and with said shaft. The web on said tube is greater in width than said tube and the flanges are greater in diameter than said tube so that the web, in loosely-wound form, can be tapped into perfect edge alignment on the tube by the flanges which can then be locked to said tube and said shaft to secure the web for transport through the apparatus.

3,598,333

APPARATUS FOR WINDING WASTE MATERIAL

James F. Beeman, and Glenn H. Roberts, both of Towanda, Pa., assignors to Sylvania Electric Products Inc.

Filed June 24, 1969, Ser. No. 836,035
Int. Cl. B21c 47/02, 47/06
U.S. Cl. 242—78.1 2 Claims



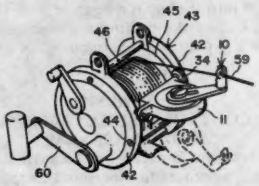
A pair of torque motor driven, constant tension, spools is provided on a rotatable table to receive waste material from a continuously operating line. A first one of the spools, which have demountable cores, is positioned to receive waste material and is wound until full. Thereafter, the table is rotated 180° to position a second spool to receive the waste material. Subsequently, the first wound spool is removed, the coiled waste material is emptied from the spool and the spool is then replaced on the table. Thus the waste material is handled without the necessity of stopping the continuously moving line.

3,598,334

LEVEL WIND GUIDE ATTACHMENT FOR FISHING REELS

Oscar Fleischer, 2610 S.W. 21st St., Miami, Fla.

Filed Jan. 20, 1970, Ser. No. 4,216
Int. Cl. A01k 89/04
U.S. Cl. 242—84.41 6 Claims



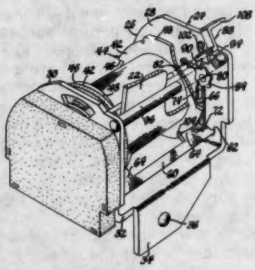
A level wind guide attachment for fishing reels having a support adapted to be pivotally secured between the end housings of he fishing reel with a gear housing mounted on the support. Within the housing are a gear and a worm gear in mesh engagement with each other, the worm gear being mounted on a shaft that extends beyond the housing and having a spring-loaded friction wheel mounted thereon. The friction wheel is adapted to engage and rotate with one of the flanges of the line-receiving spool which causes the rotation of the gear and an arm attached thereto at whose end is swiveled eyelet through which the fishing line extends and upon the revolving of the arm during the winding action of the fishing line, the latter is placed evenly on the spool.

3,598,335

SEATBELT RETRACTOR

Gerald Seeger, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1970, Ser. No. 23,412
Int. Cl. B65h 75/48
U.S. Cl. 242—107.2 7 Claims



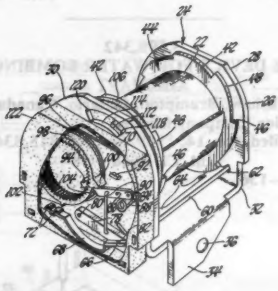
An automatic retractor of the self-locking type includes a pawl movable into and out of engagement with ratchet shoulders on the end plate of the reel to selectively lock and unlock the reel against movement in an extending direction. A slide is engageable by the pawl each time that the pawl is engaged with the ratchet shoulders to control the rotation of a lobed cam wheel. The cam wheel is engageable with successive lobes of a locking member to move the locking member from either clamped or unclamped position toward the other position. An overcenter spring controls the final movement of the clamping member from a point intermediate either position to the other.

3,598,336

SEATBELT RETRACTOR

George Edward Frost, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 7, 1970, Ser. No. 1,197
Int. Cl. B65h 75/48
U.S. Cl. 242—107.4 7 Claims



An automatic locking seatbelt retractor includes a rotatable reel biased in a belt retracting direction and having its end plates provided by circular peripherally toothed like ratchet members engageable by a rotatable spring biased pawl to block movement of the reel in an extending direction. A rotatable cam plate frictionally driven by the reel between two limit positions includes two spaced peripheral shoulders. Each shoulder is engageable with the pawl in alternate limit positions to hold the pawl out of engagement with the teeth of the ratchet members. A pivoted blocking lever is movable between blocking and unblocking positions with respect to the pawl. A pivoted control lever is linked to the blocking lever and biased to either of two positions by an overcenter torsion spring. A reel-driven ring gear includes peripherally spaced abutments engageable with the control lever. When the reel is in a fully belt-retracted position, the cam plate is in one limit position and the blocking lever is in blocking position. One of the cam plate abutments and the blocking lever engage the pawl to hold the pawl out of engagement with the teeth of the ratchet members. When the reel is rotated in a belt-extending direction and a predetermined length of belt is extended, the cam plate is frictionally driven to the other limit position and the other abutment of the cam plate engages the pawl. An abutment of the ring gear engages and then passes the control lever to move the control lever from one position to the other and in turn move the blocking member from blocking to unblocking position. Upon slight retraction and then extension of the belt after buckled to another belt to form a belt assembly, the cam plate is rotated toward the one limit position and the other abutment of the cam plate thereupon moves out of engagement with the pawl. The pawl is then spring biased into engagement with like teeth of the ratchet members and prevents further extension of the belt. As the belt is retracted, the cam plate is moved to the one limit position and the one plate abutment engages the pawl to hold it out of engagement with the ratchet members. The one abutment of the ring gear passes the control lever, and the other abutment of the ring gear engages the control lever immediately adjacent the fully retracted position of the belt to move the control lever to the one position and move the blocking lever to blocking position.

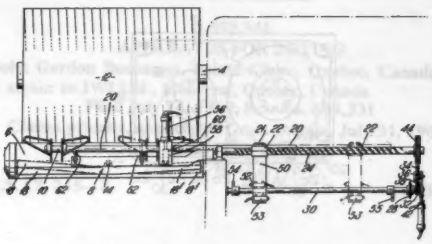
3,598,337

TAPE WINDING MACHINE

John Kay Pringle Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Oct. 31, 1968, Ser. No. 772,088
Claims priority, application Great Britain, Nov. 2, 1967, 49818/67
Int. Cl. B65h 54/28
U.S. Cl. 242—158 R 7 Claims

The provision winding machine for tape includes a takeup spindle on which the tape from a letoff source is wound, a reciprocating traverse guide having sidewalls for guiding the tape in passing to the takeup spindle, a tape guide bar movably positioned in the tape path leading from the letoff source, and means for altering the relative positions between the tape guide bar and the takeup spindle during winding to



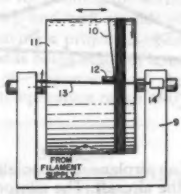
assist the tape to move with the traverse guide away from its natural straight line path on the outward strokes, and to retard the movement of the tape back towards the natural straight line path on the return strokes, thereby preventing the tape from being crushed against the sidewalls of the traverse guide.

3,598,338

FILAMENT LAYER ALIGNING DEVICE

Anatoli Brushenko, Du Page County, Ill.

Filed Dec. 6, 1968, Ser. No. 781,739
Int. Cl. B65h 75/00, 57/00
U.S. Cl. 242—158 1 Claim



This invention relates to a technique and device for accurately aligning filaments of varying size that are wound on a drum and is particularly useful in winding glass filaments for optical use. As the filamentary material is wound on a rotating steel drum, it is held in place next to the preceding winding by means of a magnetically coupled rider whose contacting surfaces are made of materials having low sliding friction. The rider is prevented from rotating with the drum by means of a rod positioned axially with respect to the rotating steel drum. The force with which the rider presses against the preceding winding or layer may be controlled by an electromagnet in the rider or by varying the alignment of the rod with respect to the axis of the steel drum.

3,598,339

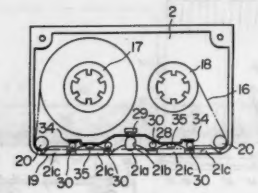
TAPE CASSETTE FOR USE IN TAPE RECORDERS

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

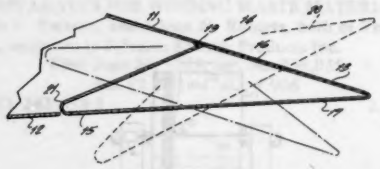
Filed Feb. 4, 1969, Ser. No. 796,470
Claims priority, application Japan, Feb. 5, 1968, Feb. 9, 1968, Feb. 9, 1968, June 29, 1968, 43/7778;43/8947;43/8948;43/54796
Int. Cl. G11b 23/10; B65h 27/00
U.S. Cl. 242—199 7 Claims

A tape cassette for use in tape recorders comprises a casing formed by two upper and lower half portions and three guide pins adapted to be engaged with the lower half portion. A faceplate covers each of the portions, and a plurality of recesses are formed in the portions and are covered by the

faceplate. A leaf spring and guide rollers are mounted in the cassette for guidably engaging the tape. These members are caused to be cooperate with each other such that locking and releasing operation of the cassettes can be simply made whereas a pinch roller and heads each having a comparatively large width can be used within a casing which is extremely thin in thickness, and also the tape can be urged against the heads with a constant pressure and that portion of the tape which is located between the two guide rollers can be maintained under tension.

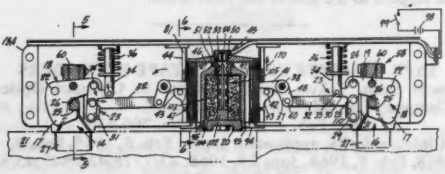


3,598,340
AIRPLANE AILERON SYSTEM
David B. Thurston, Springvale, Maine, assignor to Thurston Aircraft Corporation, Sanford, Maine
Filed Oct. 8, 1969, Ser. No. 864,626
Int. Cl. B64c *5/08*
U.S. Cl. 244—90 **4 Claims**



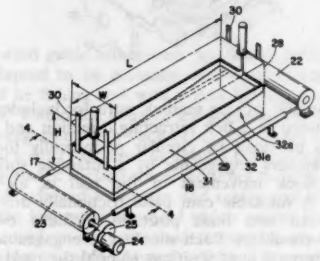
The ailerons of an airplane are specially designed to permit better control of the aircraft. The aileron is provided with an integral or attached extension portion which moves, below the wing, in coordination with the movement of the aileron.

3,598,341
AIRCRAFT STORE CARRIER
Emmett T. La Roe, Los Angeles, and Jess W. Lockhart, Torrance, both of, Calif., assignors to McDonnell Douglas Corporation
Filed Aug. 26, 1968, Ser. No. 755,030
Int. Cl. B64d *1/02*
U.S. Cl. 244—118 **7 Claims**



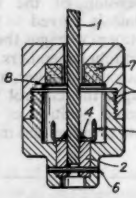
A store carrier supports a store from two store lugs. The store is supported from a substantially central point with one end of each of a pair of hooks being pivotally mounted to a carrying vehicle such as an aircraft, and the other end of each hook being linked to a latch means. A reaction force necessary to activate the hooks is related to a downward force applied thereto by the store. Clamps are provided at each suspension hook to urge each store lug against a portion of the vehicle structure to eliminate sway in the store. A thruster means is positioned adjacent the store to impart downward force to the store when released from the suspension hooks. Propellent means are provided for unlocking the latch of each hook, to activate the suspension hooks and the thruster means.

3,598,342
RELEASE DEVICE FOR WATER BOMBING FROM AIRCRAFT
John K. Hawkshaw, Brampton, Ontario, Canada, assignor to Field Aviation Company Limited
Filed Apr. 14, 1969, Ser. No. 815,834
Int. Cl. B64d *1/16*
U.S. Cl. 244—136 **6 Claims**



The specification describes a method and apparatus for releasing a water bomb from an aircraft by means of which water is released progressively by a separable support in such manner as to provide a controllable water bomb mass adapted for different bombing requirements.

3,598,343
PYROTECHNIC DEVICE FOR RELEASE OF PARACHUTE CENTRAL SHROUD
Eugene Robert Gencey, Bourges, France, assignor to Etat Francais DMA Direction Technique Des Armements Terrestres, Saint Claud, France
Filed Dec. 19, 1969, Ser. No. 886,702
Claims priority, application France, Dec. 19, 1968, 179,259
Int. Cl. B64d *17/38*
U.S. Cl. 244—152 **9 Claims**



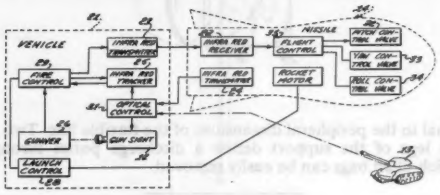
A pyrotechnic device for releasing the central shroud of parachutes. The central shroud is soldered to a knockoff ring held in place by a low-tensile retaining pin. The solder also supports a pronged firing pin in front of which is a priming compound, preferably slightly gaseous, which ignites through impact and friction and is able to melt the solder. The priming compound may be composed of a mixture of zirconium and lead chromate.

3,598,344

MISSILE COMMAND SYSTEM

Louis G. Walters, Santa Ana; Carl H. Smith, Newport Beach, and Robert Grossman, Santa Ana, all of, Calif., assignors to Philco Ford Corporation, Dearborn, Mich.

Continuation of application Ser. No. 371,715, June 1, 1964, now abandoned. This application Feb. 2, 1968, Ser. No. 707,355
Int. Cl. F41g 7/00
U.S. Cl. 244—3.11 4 Claims



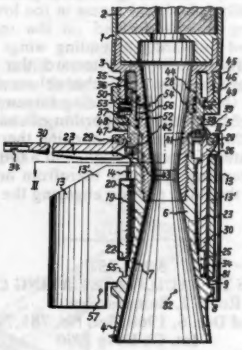
A command-type guided missile system wherein a gunner launches a missile and guides it during flight solely by maintaining the cross hairs of his sight reticle trained on the target. A source on the missile emits, rearwardly to the command station, modulated (coded) infrared (IR) light. Visible light from the target and IR light from the source are received at the command station through a common optical system. A beam splitter then sends the visible light to the gunner's sight and sends the IR light through a nutator to a quadrant-type IR detector, which is coupled to the gunner's sight so that the axis of symmetry thereof is always aligned on target. Error signals from the detector indicate the direction of deviation of the image of the source from the axis of the detector and hence the direction of deviation of the missile from the gunner's line of sight to the target. A transmitter, responsive to the error signals, sends modulated IR control signals to the missile to correct its flight path.

3,598,345

ROCKET WITH FOLDING FINS AND BRAKING DEVICE

Xaver Suter, Ruschlikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Sept. 6, 1968, Ser. No. 758,067
Claims priority, application Switzerland, Sept. 6, 1967, 12471
Int. Cl. F42b 13/32
U.S. Cl. 244—3.27 6 Claims



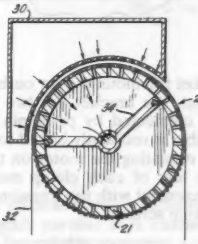
Rocket having a nozzle body with a unit of folding fins arranged around the body. Means are provided for swinging the fins out of a normal position into an operating position. A braking device varies the flight path of said rocket and has swiveling flaps which in the normal position of the fins are located between the fins and the nozzle body in an inactive position. When the rocket is launched the forces that come into action swing the flaps into a braking position. Latch members cooperate with the flaps and are displaced by the fins to release the flaps.

3,598,346

APPARATUS FOR DRYING

John Gordon Buchanan, Pointe Claire, Quebec, Canada, assignor to JWI Ltd., Montreal, Quebec, Canada

Filed July 24, 1969, Ser. No. 844,331
Claims priority, application Great Britain, July 31, 1968, 36557/68
Int. Cl. B21f 27/18
U.S. Cl. 245—8 10 Claims



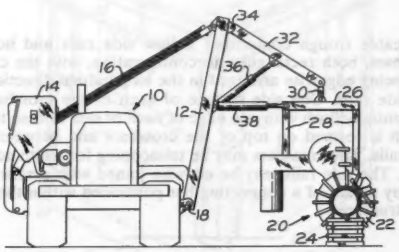
A woven wire cloth for forming the surface of a drier drum and composed of warp and weft strands of 0.003- to 0.015-inch diameter and having a projected open area of 10 to 40 percent with the strands being made of a metal alloy having a mean coefficient of expansion of less than 2×10^{16} inches/inch/° F. in a temperature range of 0° F. to 400° F.

3,598,347

APPARATUS FOR SUPPORTING AND POSITIONING PIPE WELDERS

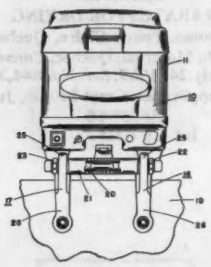
Lloyd J. Marburger, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1969, Ser. No. 864,356
Int. Cl. B66c 23/54
U.S. Cl. 248—2 1 Claim



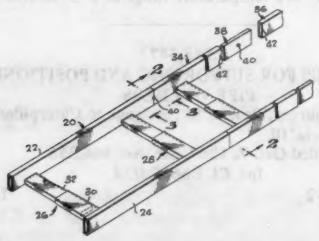
A tractor-mounted support for a pipe-welding device which comprises a boom on the tractor, a frame supported by the boom and supporting the welder and adjusting means between the boom and the frame to position the welder precisely with respect to the pipe to be welded.

3,598,348
CLAMP BRACKET FOR OUTBOARD MOTOR
Elmer Carl Kiekhaefer, Winter Haven, Fla., assignor to Brunswick Corporation, Chicago, Ill.
Filed Dec. 5, 1969, Ser. No. 882,490
Int. Cl. B63h 21/26
U.S. Cl. 248—4 8 Claims



A clamp bracket for mounting an outboard motor on the transom of a boat, the bracket has two inverted U-shaped clamp members connected by pivot pin. The inside leg of each clamp member is resiliently biased toward an open position to facilitate mounting the motor on transoms of varying thicknesses. The legs of each clamp member are clamped into bearing engagement with the transom by means of an interconnecting clamp screw.

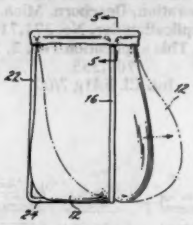
3,598,349
CABLE TROUGH
King B. Drake, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.
Filed Nov. 13, 1969, Ser. No. 876,480
Int. Cl. H02g 3/04; F16l 3/22
U.S. Cl. 248—49 9 Claims



A cable trough comprising hollow side rails and hollow crossbars, both rectangular in configuration, with the crossbars being edgewise arranged in the longitudinal direction of the side rails. One side surface of each of the crossbars is substantially flush with one edge of each of side rails so that a trough is formed on top of the crossbars and between the side rails. The crossbars may be telescoping for width adjustment. The side rails may be endwise joined with similar side rails by means of a connecting bar positioned within the hollow structure.

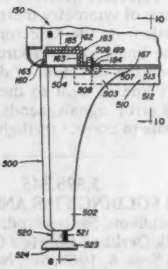
3,598,350
BAG HOLDER
Charles W. Kaufman, Wyncote, Pa., assignor to Westmoreland Mfg. Co., Philadelphia, Pa.
Filed July 30, 1969, Ser. No. 846,098
Int. Cl. B65b 67/12
U.S. Cl. 248—97 3 Claims

A support for retaining a flexible bag in an open position is disclosed. The support includes three legs which are joined together at a common juncture and an upper frame member which defines an opening having dimensions approximately



equal to the peripheral dimensions of the flexible bag. Two of the legs of the support define a discharge portal through which filled bags can be easily removed.

3,598,351
PEDESTAL AND LEG CONSTRUCTION
Kenneth D. Schreyer, Doylestown, Pa., assignor to Lyon Metal Products, Inc., Aurora, Ill.
Division of Ser. No. 635,939, Apr. 5, 1967, abandoned, which is a division of Ser. No. 503,157, Oct. 23, 1965, Pat. No. 3,363,955. Filed Jan. 17, 1969, Ser. No. 835,825
Int. Cl. A47b 13/02
U.S. Cl. 248—188.4 7 Claims

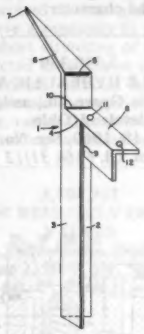


The present invention is directed to a furniture leg construction comprising an upstanding body having a lower end and a substantially rearwardly extending elongated upper end, a substantially cylindrical recess in the lower end of the body and having threads formed on the inner periphery thereof, a pair of outwardly extending wings on the upper end of the body and disposed toward the forward edge thereof, the upper end having a channel-receiving notch in the rear portion thereof and extending forwardly and into at least a portion of the wings, the portion of each of the wings with the notch therein having an opening therein for receiving mounting fasteners therethrough, and a foot having an integral shank extending upwardly therefrom and carrying an integral molded threaded portion engaging the threads in the body.

3,598,352
APPARATUS TO FACILITATE LAYING OF BRICKS
Irvin H. Harris, Route 2, Bumpass, Va.
Filed Dec. 6, 1968, Ser. No. 781,798
Int. Cl. E04g 3/00
U.S. Cl. 248—235 5 Claims

Apparatus to facilitate laying of bricks, comprising two or more identical brackets held in horizontally spaced aligned relation by attachment to a common platform or board. The assembly is supported in temporary position at a height convenient for the mason, by tangs one of which extends horizontally from each bracket and is embedded in mortar

between the bricks of two superposed courses. Bricks to be laid are placed on this platform and used as required. When the wall has been erected by a few more courses the as-



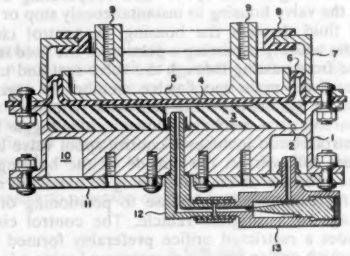
sembly is withdrawn, the tangs are rested on the bricks of the presently uppermost course, and the platform is again used as aforesaid.

3,598,353

AIR-DAMPED SHOCK MOUNT

Richard Paul De Grey, Pasadena, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Mar. 16, 1970, Ser. No. 19,744
Int. Cl. F16f *15/08*
U.S. Cl. 248—358 **2 Claims**



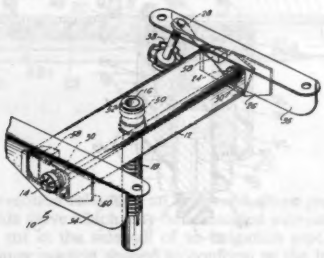
An air-damped shock mount wherein the object support pad rests on a rubber bumper at normal atmospheric pressure; e.g., sea level and is supported on a volume of air at low atmospheric pressure; e.g., high altitude.

3,598,354

CHAIR CONTROL STRUCTURE

Philip J. Williams, Bridgeport, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Aug. 27, 1969, Ser. No. 853,345
Int. Cl. A47c *3/023*
U.S. Cl. 248—373 **11 Claims**



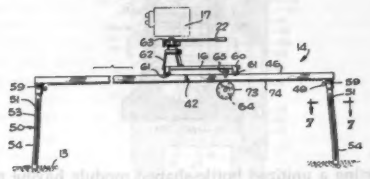
The following specification describes a support body having a rectangular cross section for a torsion-bar chair control utilized in office type chairs with the post-support member located behind the torsion bar and engaged with the lower and upper support body walls.

3,598,355

CAMERA DOLLY

Helen V. Bryan English, 16725 Knollwood Drive, Granada Hills, Calif.

Filed Aug. 21, 1968, Ser. No. 754,381
Int. Cl. F16m *11/20*
U.S. Cl. 248—430 **10 Claims**



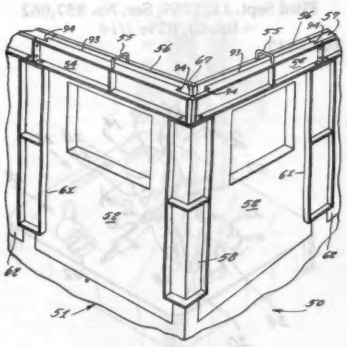
The camera dolly disclosed herein includes a frame having a pair of spaced-apart parallel rails carried on adjustable height leg supports for rollably mounting a camera carriage. The carriage includes a universal mount for releasably mounting a motion picture camera. Power means are provided for controllably moving the carriage on the rails via a drive train interconnecting the carriage on the rails. The camera dolly is adapted for employment for filming underwater scene sequences that are adapted to be viewed in a panoramic theater.

3,598,356

KEY CAST CONCRETE CONSTRUCTION SYSTEM

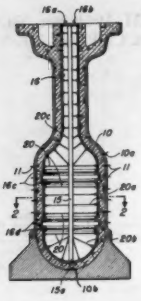
Robert C. Amann, 3465 South 108th St., c/o R. W. Industries, Inc., West Allis, Wis.

Filed July 12, 1967, Ser. No. 652,779
Int. Cl. E04g *15/00*
U.S. Cl. 249—35 **2 Claims**



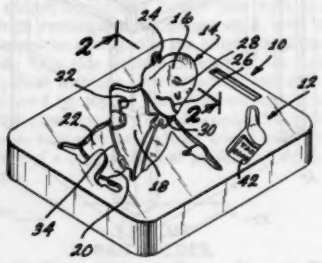
A system for precasting concrete panels of a uniform modular dimension and erection of the same using a tapered keyslot and forming system so to speed production on single and multistory buildings.

3,598,357
APPARATUS FOR CONSTRUCTING A BOTTLE-SHAPED MODULE
William B. McLean, 3532 Lowell Way, San Diego, Calif.
Filed June 12, 1969, Ser. No. 832,566
Int. Cl. B28b 7/32
U.S. Cl. 249—65 1 Claim



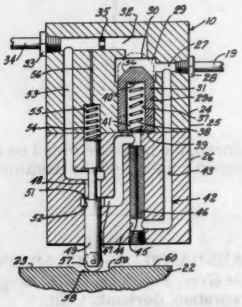
Casting a unitized bottle-shaped module having no seams or unsecured junctures is provided by forming a shell-shaped casting void between a conventional, external shell mold and a similarly shaped flexible baglike inner form carried on an elongate support member. A plurality of trammeling tie wires of discrete lengths joins the bag and the support member to limit the degree and manner of extension of the flexible bag as fluids fill its interior. The bag, performed according to the inner dimensions of a bottle-shaped module, provides an inner surface for mold and is equal-distantly spaced from the inside of the outer form. As a casting material, e.g., concrete in poured into the casting void, water and/or pressurized air is passed to the bag's interior to provide a sufficiently strong retaining wall capable of counteracting the lateral force produced by the casting material before it hardens. After the concrete hardens, removal of the fluid from the interior of the bag allows its collapse, and the support member, tie wires, and bag are withdrawn from the cast module. Thusly, a unitized cast flotation module is provided having no seams, lines of joinder, or similar areas structurally weaker than the remainder of the casting.

3,598,358
TOY-MOLDING APPARATUS
Wanda L. Clearwaters, Hermosa Beach; Thomas G. Frickanisce, Hawthorne, and Christie M. Matson, Los Angeles, all of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 11, 1969, Ser. No. 857,062
Int. Cl. B29c 1/14
U.S. Cl. 249—117 2 Claims



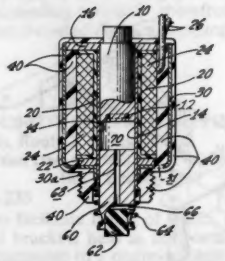
A toy mold which enables children to form plastic characters and other items with accurately formed facial features and with different colored sections clearly separated from each other. The mold comprises deep narrow depressions in the cavity walls that define the mouth and other facial features, and which serve as dividing lines at the collar and other areas. A child can fill these small depressions with black molding material, wipe away any excess that overflows the depression, and allow the material to set. He can then place lighter colored molding material in the rest of the cavity to form the rest of the character.

3,598,359
BISTABLE HYDRAULIC VALVE
Beldon L. Rich, Buffalo Grove, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Mar. 18, 1969, Ser. No. 808,088
Int. Cl. F16k 31/12
U.S. Cl. 251—44 2 Claims



a bistable hydraulic valve for controlling fluid flow in a hydraulic line having a main spool valve cooperating with a valve seat in the valve housing to instantaneously stop or permit flow of fluid through the housing. A control circuit disposed in the housing bypassing a portion of the fluid in the hydraulic line from passing through the valve seat and to act on a surface of the main spool valve member to urge the main spool valve against the valve seat with virtually a snap action comparable to a mechanical over center toggle linkage. The control circuit includes a control spool valve actuated by a cam follower on the outside of the housing for regulating the pressure of the fluid acting to close the main spool valve for example, in response to positioning of the steering linkage of a dirigible vehicle. The control circuit further includes a restricted orifice preferably formed in a metal insert which orifice forms a passageway having a length approximately 20 times the diameter of the orifice.

3,598,360
SOLENOID VALVE
Delbert L. Merriner, Glendale, and Woodrow W. Miller, Los Angeles, both of, Calif., assignors to Richdel, Inc., Los Angeles, Calif.
Filed Aug. 27, 1969, Ser. No. 853,402
Int. Cl. F16k 31/06; H01f 3/00
U.S. Cl. 251—129 10 Claims



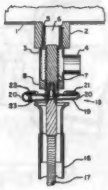
An improved solenoid valve is provided which is encapsulated in a thermosetting plastic to minimize the corrosive ac-

tion of soil, fertilizers, or chemicals, when the valve is used, for example, in conjunction with a lawn sprinkling system, or the like. The solenoid valve is constructed to be encased in a molded thermosetting plastic housing, and which is formed to eliminate air voids around the energizing coil of the solenoid and which would have a tendency to produce a wicking action with resulting short circuiting of the coil. The solenoid valve also is constructed to minimize electrolytic action with its resultant deteriorating effects; this being achieved by maintaining similar metals throughout the structure, and by using epoxy adhesive, rather than soldered or brazed connections, to hold various components of the assembly together.

3,598,361
APPARATUS FOR REMOTELY OPERATING DRAIN VALVES

Raymond W. Crowe, 7625 Alaska, Bridgeport, Mich.

Filed June 2, 1969, Ser. No. 829,228
Int. Cl. F16k *31/46*
U.S. Cl. 251—144 **8 Claims**

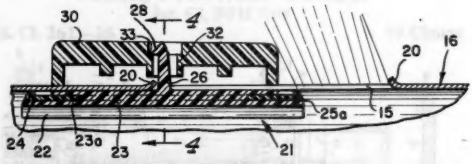


Apparatus for remotely operating a drain valve associated with a container such as a vehicle radiator, oil sump or the like and having a rotary valve stem provided with a handle having channel-shaped ends, the operating apparatus having a rotary actuator joined by a flexible cable to a coupling having fingers fitted into the channel-shaped members and removably clamped to the valve handle. The rotary actuator is mounted at a level above the drain valve so as readily to be accessible to a person desiring to manipulate the drain valve.

3,598,362
DIRECTIONAL CONTROL IRRIGATION VALVE

Willis Allen Heidemann, Wilcox, Nebr. 68982

Continuation-in-part of application Ser. No. 808,538, Mar. 19, 1969, now abandoned. This application Sept. 22, 1969, Ser. No. 864,264
Int. Cl. F16k *3/28*
U.S. Cl. 251—145 **11 Claims**

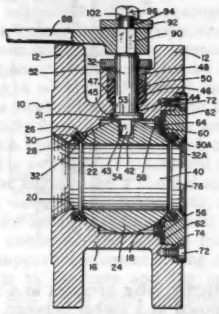


The invention relates to an improved, three-piece noncorrosive slide valve which may be assembled without tools in an opening cut in the sidewall of an irrigation pipe. The valve has an inner portion shaped to conform to the inside of the pipe, with a removable, replaceable gasket, and an outer portion shaped to conform to the outside of the pipe and a centrally located clamping member.

3,598,363
BALL VALVE

Harry N. Shaw, Chicago, Ill., assignor to The Golconda Corporation, Chicago, Ill.

Filed Sept. 4, 1969, Ser. No. 855,086
Int. Cl. F16k *25/00*
U.S. Cl. 251—172 **19 Claims**

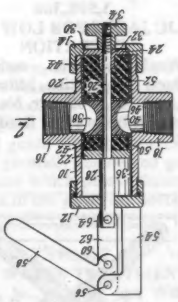


A ball valve having fireproof spring-pressed bearing rings serving as secondary seals on both sides of the ball with a primary chevron-shaped flexible plastic seal between the secondary seal bearings adjacent to the inlet side of the valve as back by a seal support ring with some lost motion so that when the valve is closed, the inner edge of the primary is marginally pressed flat against the ball by pressure on one side of the valve, and when pressure is on the other side of the ball the V-shape of the chevron is flattened substantially to press the chevron edge against the ball.

3,598,364
EXPANSIBLE PLUG VALVE HAVING A RECTILINEAR MOTION

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Worcester, Mass.

Filed Apr. 16, 1969, Ser. No. 816,554
Int. Cl. F16k *3/16*
U.S. Cl. 251—189 **2 Claims**



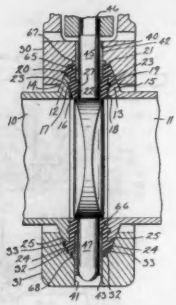
A valve including a valve body with a chamber therein and a removable elastomeric valve member in the chamber including means for expanding the valve member under normal usage thereof whether open or closed, said valve body member having an open end with a removable closure therefor allowing removal of said valve member from the valve body.

3,598,365

BUTTERFLY VALVES

Bruno H. Werra, Waukesha, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Aug. 28, 1969, Ser. No. 853,796
Int. Cl. F16k *1/22*; B65d *53/02*; F16l *19/02*
U.S. Cl. 251—307 **10 Claims**



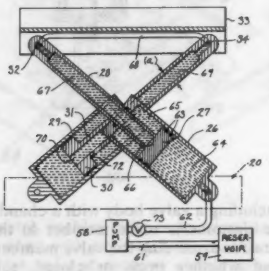
A metal butterfly valve operates in a resilient valve seat which is interposed as a gasket between the flanges of two pipe ends, the seat having portions which project radially outwardly beyond the pipe flanges and which have tapered sides to match the tapers of the pipe flanges. Semicircular clamping elements act on the tapers of both the flanges and the valve seat to create a seal between the pipe ends. The bore of the resilient seat has opposed openings at the 6:00 and 12:00 o'clock positions through which the valve stem passes. The internal diameter of the seat is slightly greater, before assembly, along an imaginary line extending through the 3:00 and 9:00 o'clock positions and connecting the splits of the clamping elements than along a line extending through the 6:00 and 12:00 o'clock positions. In addition, between the 11:00 and 5:00 o'clock and the 1:00 and 7:00 o'clock positions the internal diameter of the seat is less than the before-mentioned diameters, being struck from a longer radius, which radius has its center at eccentric points beyond the true center of the bore of the seat. The valve stem openings in the resilient seat are recessed from the OD to receive the lower extensions of valve stem bushings, which, in assembly, serve to compress the material around the valve stem holes to increase the stem sealing pressures. The construction of the seat is such that, after assembly, there is a relatively uniform seal all around the valve disk without interference with operating movement of the valve disk.

3,598,366

HYDRAULIC JACKS FOR LOW HEAD ROOM OPERATION

Donald Juds, Waukesha, Wis., assignor to Milwaukee Hydraulic Products Corporation, Milwaukee, Wis.

Filed Apr. 18, 1969, Ser. No. 817,474
Int. Cl. B60p *1/00*; B66f *3/22*
U.S. Cl. 254—2 B **13 Claims**



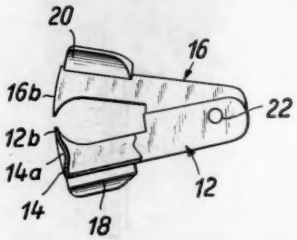
An hydraulic jack having an elongated base and an elongated lifting head, there being crossing hydraulic rams connected between the base and head, and there being sets of leveling links connected between the base and head on opposite sides of the rams for jack-knifing movement in opposite directions when the jack is being operated, the hydraulic circuit to the rams including means for causing the two ram pistons to travel at the same speed.

3,598,367

STAPLE OPENER

Bruno Ghibely, Ahrensburg, Holstein, Germany, assignor to Esco Metallwaren Martin Huhnken K.G., Ahrensburg, Holstein Bruckenstr, Germany

Filed July 9, 1969, Ser. No. 840,305
Claims priority, application Germany, Nov. 8, 1968, P 18 07 688.5
Int. Cl. B25c *11/00*
U.S. Cl. 254—28 **9 Claims**



The staple opener comprises two levers swingably connected near their one ends and having each a pair of peaks at their other ends. A tongue is formed at the end of one lever between the two peaks thereof. The opener is suited for staples of two different sizes.

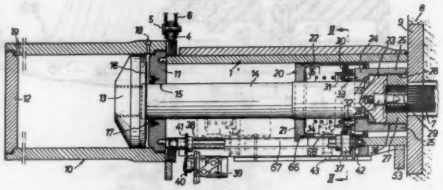
Staples with greater distance between the staple legs can be opened by means of the opposite pairs of peaks. Staples with smaller distance between the staple legs can be opened by means of the tongue and the opposite pair of peaks.

3,598,368

WIRE-TENSIONING APPARATUS FOR USE IN STRESSING CONCRETE STRUCTURES

Antonio Brandestini, 60, Alte Landstrasse, Kusnacht, and Hans Rudolf Siegwart, both of Zurich, Switzerland, assignors to Antonio Brandestini, Zurich, Switzerland, by said Hans R. Siegwart

Filed May 26, 1969, Ser. No. 827,790
Claims priority, application Switzerland, May 27, 1968, 7877/68
Int. Cl. E21b *19/00*
U.S. Cl. 254—29 **8 Claims**



Apparatus for tensioning members in a concrete structure including an anchor head receiving the stressing members comprises a housing adapted to be supported against the concrete structure, a hydraulically or pneumatically operated

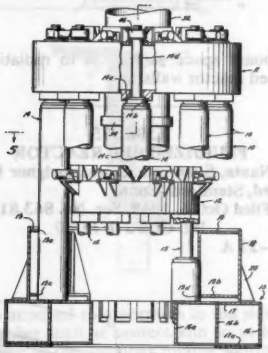
traction member adapted to reciprocate within the housing for stressing the tensioning members, a coupling device arranged at the free end of the traction member for connecting the traction member to the anchor head, means for holding the housing in position against the concrete structure, means for axial alignment of the traction member with the anchor head, and motor-driven means for rotating the coupling device when the traction member and the anchor head are aligned to produce engagement of the coupling device with the anchor head.

3,598,369

HYDRAULIC CASING HANDLING APPARATUS

Ralph D. Yielding, 7656 Glen Prairie, Houston, Tex.

Filed Feb. 7, 1969, Ser. No. 797,574
Int. Cl. B66f *1/00*
U.S. Cl. 254—106 **14 Claims**



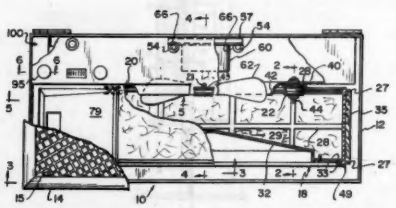
For use in raising, lowering or supporting large diameter casings such as used in wells or mines, a hydraulic device which preferably supports large diameter casings by means of lift rings which are engaged by upper and lower jack rings which are each independently movable upwardly or downwardly and which are equipped with radially inwardly directed support shoes for engaging the lift ring independently so as to provide an apparatus which handles massive loads even in the event of crooked support rings on the casing, misaligned casing, and other variations from perfect alignment.

3,598,370

HUMIDIFIER

Kip J. Hoag, Albion, Mich., assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 14, 1969, Ser. No. 841,212
Int. Cl. B01f *3/04*
U.S. Cl. 261—26 **10 Claims**



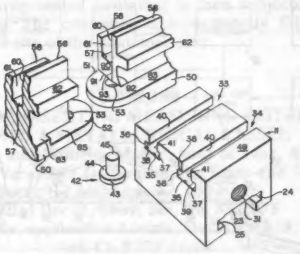
A humidifier having an outer case, and a water container and drum supporting humidifying material on the open periphery thereof within the case, spaced drive and idler pulleys engaging the inner edge of one open diametric drum wall and rotatably supporting the drum with part under the container water material progressively wetted and moved toward the idler pulley, and a radial flange on the idler pulley disposed outwardly adjacent the side edge of the drum suitable to convey excess drum water away before contacting the drive pulley; air moving means including a venturi opening and a fan centrally mounted therein for forcing air into the open diametric wall and through the humidifying material, and a fan mounting bracket having spaced rods that fit through grommets supported within openings in opposing case walls asymmetrically located on opposite sides of the venturi opening until a crossmember interconnecting the rods engages the adjacent grommets to center the fan within the venturi opening; a water level control including a one piece float structure having a hub pivoted to the case and a float supported radially from the hub by an arm, a rotatable indicator drum visible outside the case, a link connecting the drum and hub, and a switch control element supported adjacent the hub to be engaged by a chordal surface thereon when the container water level is inadequate; and a humidistat and a housing for isolating the humidistat from case air ambient the water container, the housing including a one piece resilient self-supporting element having opposite edges secured by brackets to the case and the interconnecting edges abutted and held under slight compression by sandwiching case walls, one of which is removable.

3,598,371

TENTER FRAME

Frederick Hyatt, Providence, R.I., assignor to Bevis Industries, Inc., Providence, R.I.

Division of Ser. No. 737,148, June 14, 1968, Pat. No. 3,529,322.
Filed Oct. 17, 1969, Ser. No. 867,137
Int. Cl. D06c *3/02*
U.S. Cl. 26—57 R **6 Claims**



This invention relates to tenter frames and more particularly to a plurality of stands, one for each saddle, aligned laterally and longitudinally in spaced relation to support pivotally connected guide rail sections constituting opposite and generally parallel guide paths for tenter clip chains with the pivot pins of the pivotally connected guide rail sections lying in a vertical plane which passes through the front rail face of the guide paths of the guide rail sections.

3,598,372

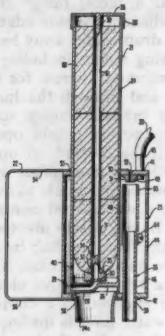
COOLING TOWER WATER TREATMENT APPARATUS

Thomas E. Schneider, Jr., Atlanta, and William E. Bradley, Jr., Smyrna, both of, Ga., assignors to Tesco Chemicals, Inc., Atlanta, Ga.

Filed Jan. 15, 1969, Ser. No. 791,430
Int. Cl. B01f *3/04*
U.S. Cl. 261—110 **10 Claims**

Cooling tower water treatment apparatus comprising a chemical-mixing device connected to the water makeup valve of the cooling tower. The chemical-mixing device includes a chemical container for supporting a shaped chemical composition, and a water container communicating with the water level valve and with the lower portion of the chemical container. The water flowing from the makeup

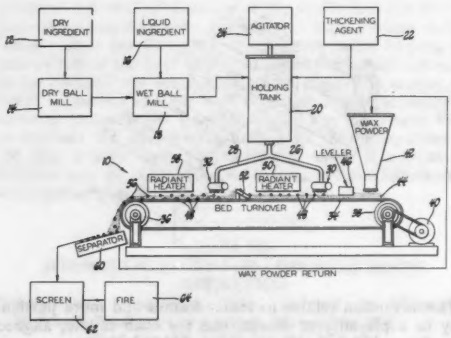
valve through the water container impinges upon the lower portion of the shaped chemical composition so that the lower portion of the shaped chemical composition erodes and is mixed with the makeup water.



3,598,373
METHOD AND APPARATUS FOR MAKING SMALL CERAMIC SPHERES

Edward A. Inman, Lakewood, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Filed Mar. 26, 1970, Ser. No. 22,976
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 12 Claims



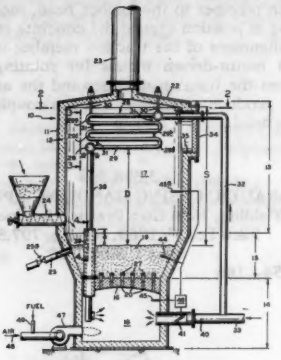
A method of making small ceramic spheres by discharging drops of ceramic slip onto a moving bed of powdered material. Maximum sphere density in the bed is achieved by orienting the drop nozzles angularly across the bed and inverting the bed after receiving a first layer of spheres to form a new bed surface. A simple ramp device performs the inversion.

3,598,374
FLUIDIZED BED REACTOR WITH PREHEATING OF FLUIDIZING AIR

Robin G. F. Nauta, Stamford, Conn., assignor to Dorr-Oliver Inc., Stamford, Conn.

Filed Oct. 6, 1969, Ser. No. 863,815
Int. Cl. F27b *15/00*
U.S. Cl. 263—21 A 13 Claims

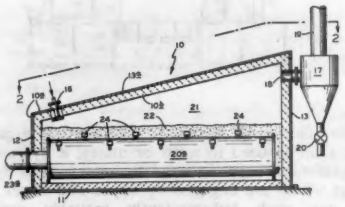
A fluidized bed reactor for carrying out an oxidizing reaction of materials maintained in a fluidized state on a constriction plate, by fluidizing air forced upwardly through the constriction plate, and preheated by being forced through a heat exchange tube system located in the free board space of the reaction chamber, exposed to the heat of the reaction gases in the free board space as well as to radiation heat from refractory-lined reactor walls.



3,598,375
FLUIDIZED BED REACTOR

Robin G. F. Nauta, Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Oct. 6, 1969, Ser. No. 863,816
Int. Cl. F27b *15/00*
U.S. Cl. 263—21 A 31 Claims

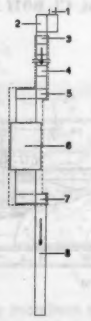


A fluidized bed reactor featuring a self-contained prefabricated wind box structure.

3,598,376
PLANT FOR DRYING, FIRING AND STACKING BRICKS

Enrico Putin, via P. Trevisan 2, Villaveria, Vicenza, Italy

Filed Aug. 27, 1969, Ser. No. 853,406
Claims priority, application Italy, Sept. 7, 1968, 61626-A/68
Int. Cl. F27b *9/00*
U.S. Cl. 263—28 8 Claims



An automatic plant is provided for the continuous drying, firing and stacking of bricks and the like. The plant includes

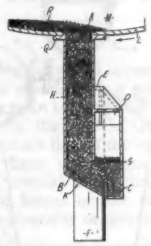
a tunnel. The drying of the material takes place in a first section of the plant in several stages with the bricks to be dried being spaced apart and subsequently reassembled. Then the bricks are moved through a next section in which they are superimposed and may be reassembled again. This movement takes place at a variable speed to compensate for any temporary stoppages in the working cycle. When the drying is completed the bricks enter into a firing kiln. From there, they move to a discharge surface upon which stacks of bricks are formed.

3,598,377

ROTARY KILN SAMPLER

Martin John Galliers, Kent, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Filed Sept. 16, 1969, Ser. No. 858,464
Claims priority, application Great Britain, Sept. 26, 1968, 45,705/68
Int. Cl. F27b 7/20; G01n 1/00
U.S. Cl. 263—33 R **7 Claims**



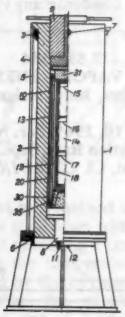
A sampler is attached to a porthole in the side of a rotary processing chamber such as cement kiln so as to describe a circle and revolve as the chamber rotates. During such rotation, sample material falls from the chamber into an inlet segment of a conduit in the sampler, passes round a loop in the conduit and discharges from an outlet segment at the compleuon of a revolution. The sampler may take the form of a single continuous curved tube or may be formed by joining separate sections of pipe or tube.

3,598,378

FURNACE FOR HEAT-TREATING OBJECTS UNDER HIGH PRESSURE

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Electriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 8, 1969, Ser. No. 855,911
Claims priority, application Sweden, Sept. 12, 1968, 12,258
Int. Cl. F27b 5/00
U.S. Cl. 263—41 **8 Claims**



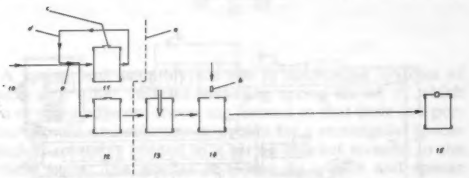
A furnace for treating material at high pressure and high temperature includes a pressure chamber and a cylindrical sheath within and spaced from the pressure chamber. The sheath is formed of three concentric annular walls forming between them substantially closed inner and outer shells. The interior of the inner shell constitutes the furnace chamber. The spaces between the walls are filled with insulating material, and the spaces between the walls open into the furnace chamber and the space between the pressure chamber and the sheath. The inner annular wall is formed of a material having a smaller coefficient of expansion than the material of the other annular walls.

3,598,379

METHOD OF ASEPTICALLY PACKAGING METAL CONTAINERS

Martin Laupheimer, Braunschweig, Germany, assignor to Schmalbach-Lubeca-Werke, A.G., Braunschweig, Germany

Filed Aug. 25, 1969, Ser. No. 852,579
Claims priority, application Germany, Sept. 6, 1968, P 17 92 481.1
Int. Cl. F27b 9/04; F26b 7/00
U.S. Cl. 263—52 **7 Claims**



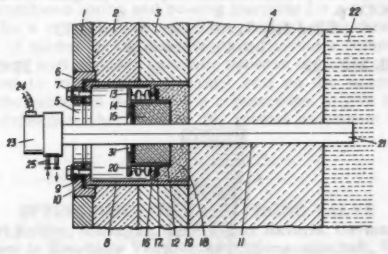
A method for forming aseptic cans and includes the step of temporarily sealing the containers at the manufacturing site. The temporarily sealed container is then subjected to heat for sterilizing. The container is subsequently filled with a product at the site of the container user.

3,598,380

DEVICE FOR INSERTING MEASURING INSTRUMENTS INTO A METALLURGICAL VESSEL

Walter Jilek, and Wilhelm Muller, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

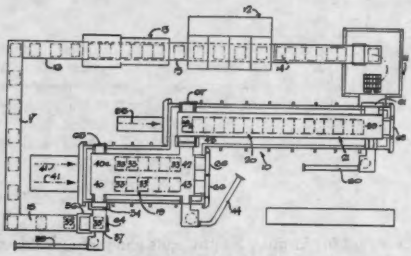
Filed Dec. 4, 1969, Ser. No. 882,075
Claims priority, application Austria, Dec. 19, 1968, 12343/68
Int. Cl. F27d 21/04
U.S. Cl. 266—1 R **5 Claims**



The invention relates to a device for inserting measuring instruments into a metallurgical vessel. The measuring instrument which may comprise a guiding tube containing a thermocouple serving to measure the bath temperature or a mea-

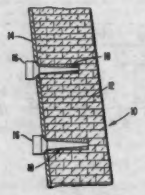
suring rod serving to measure the conductivity of the metal bath, penetrates the shell and the refractory lining of the metallurgical vessel and is supported by a bushing which is inserted in the vessel shell and penetrates the outer lining and the rammed lining, said measuring instrument being connected to the bushing by means of wave compensating means, e.g., concertina walls extending between annular flanges provided on the bushing and on a sleeve surrounding the measuring instrument, respectively. In the area of the rammed lining the interspace between the bushing and the measuring instrument is filled with particulate refractory material. The new arrangement affords the great advantage that the measuring instrument may follow the movements of the inner lining in any direction without being subjected to shearing stresses.

3,598,381
CONTINUOUS CARBURIZING FURNACE
Donald J. Schwalm, Northville, and Edward C. Bayer, Dearborn, both of, Mich., assignors to Holcroft & Company, Livonia, Mich.
Filed Feb. 26, 1969, Ser. No. 802,434
Int. Cl. C21d 9/00
U.S. Cl. 266—5 **10 Claims**



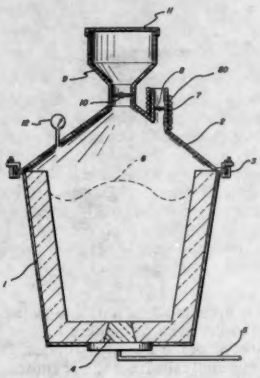
A continuous carburizing furnace comprising a heating chamber having inlet door means through which, when open, work can be fed into the chamber, a carburizing chamber, interconnecting door means between the chambers through which, when open, work can be fed from the heating chamber to the carburizing chamber, first feeding means for feeding work fed into the heating chamber into a transfer position within said chamber, second feeding means for feeding work from the transfer position through the interconnecting door means when open to a feed position in the carburizing chamber, third feeding means for feeding work from the feed position towards outlet door means of the furnace and means for operating the interconnecting door means when at least the inlet door means are closed.

3,598,382
FURNACE WALL COOLING
Edward J. Ostrowski, Steubenville, Ohio, assignor to National Steel Corp.
Filed July 9, 1969, Ser. No. 840,272
Int. Cl. C21b 7/10
U.S. Cl. 266—32 **22 Claims**



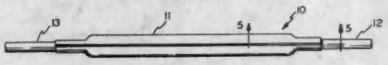
Blast furnace walls are cooled by circulation of water through cooling plates provided with baffles to control cooling water flow. The baffles include a J-shaped baffle, a central baffle, and two stub baffles. Streamlined protrusions on the baffles, the stub baffles themselves, and a flared water passage minimize whirlpool action within the plate, thereby avoiding low water throughput, sedimentation and resultant overheating which leads to failure of the cooling plate. An aperture in the central baffle vents air to a water discharge outlet, to prevent entrapment of air within the plate and concomitant production of water-void areas which also promote plate overheating.

3,598,383
METHOD AND APPARATUS FOR INCORPORATING ADDITIVES IN A MELT
William H. Moore, Meadow Lane, Purchase, N.Y., and Harry H. Kessler, 7 Dromara Road, Ladue, Mo.
Filed Jan. 14, 1969, Ser. No. 791,062
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T **5 Claims**



A method and apparatus for incorporating a normally oxidizable and/or volatile additive into a molten metal bath disposed in a vessel with a relatively gas tight cover thereover. A gas which is normally nonreactive with the additive is introduced, in one form of the invention, through a porous refractory plug in the bottom of the vessel and this gas bubbles up through the molten metal agitating the metal and fills the space above the metal and under the cover with at least a small positive pressure of the gas. This gas substantially excludes air from the space above the metal. A gas outlet is provided in the cover and is controllable for the purpose of regulating the outflow of gas to atmosphere thereby regulating the gas pressure above the metal surface. An additive container or hopper directly communicates by way of a valve with the space above the metal so that when desired an additive can be introduced into the molten metal. Cooling means are disclosed to condense any volatilized additive.

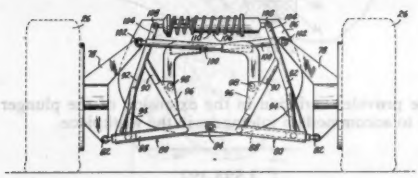
3,598,384
METAL VAPOR GENERATORS
Mario Zucchinelli, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy
Filed Sept. 10, 1969, Ser. No. 856,529
Claims priority, application Italy, Sept. 13, 1968, 21,185A/68
Int. Cl. C22b 61/00
U.S. Cl. 266—39 **10 Claims**



A particle free device for releasing a metal vapor comprising: a container having walls defining a chamber; an opening

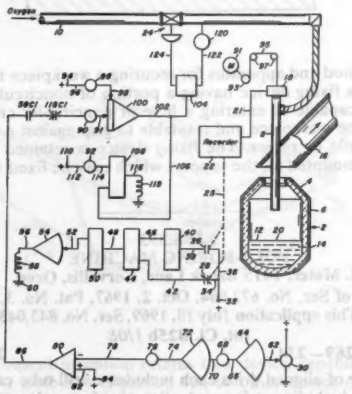
in at least one of said walls; a particulate, metal vapor releasing substance within the chamber; and a member within the chamber and adjacent to the opening whereby the opening is rendered permeable to metal vapor but impermeable to the particulate substance.

3,598,385
VEHICLE WHEEL SUSPENSION SYSTEM
Charles F. Parsons, Jr., 520 Brierhill Road, Deerfield, Ill.
Filed Mar. 27, 1969, Ser. No. 811,130
Int. Cl. B60g *3/18, 3/26*
U.S. Cl. 267—20 A **3 Claims**



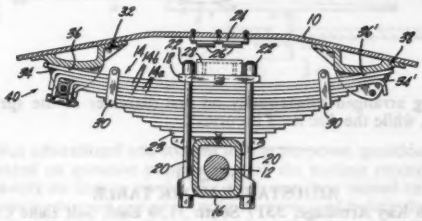
Independently mounted wheel supports on opposite sides of a vehicle are each mounted by a pair of upper and lower links. Corresponding main links of each pair are pivoted on a single common axis on the vehicle. The other link of each pair is pivoted to the main link of the opposite pair, at a point vertically displaced from said common axis, to hold the wheels parallel and coaxial at all times with their camber unaffected by lateral forces on the vehicle. The system is equally applicable to steerable or driven wheels.

3,598,386
APPARATUS FOR MAKING STEEL
Joseph A. Murphy, Murraysville, Pa., assignor to Crucible Steel Company of America, Pittsburgh, Pa.
Filed Oct. 9, 1967, Ser. No. 673,666
Int. Cl. C21c *5/32*
U.S. Cl. 266—35 **4 Claims**



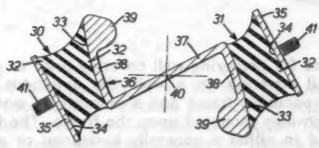
This invention relates to a method and apparatus for making steel in a converter top-blown with oxygen. In particular, the invention relates to operating a converter top-blown with oxygen by monitoring the temperature on the area of the bath surface contacted by the oxygen jet, which is the reaction zone, determining the reaction-zone temperature decrease indicating the end of desiliconization of the bath, and thereupon increasing the amount of oxygen and preferably also decreasing the height of the oxygen lance above the bath surface during the carbon-removal portion of oxygen blowing. The increased oxygen flow rate and decreased lance height is maintained for the remainder of the Steelmaking operation.

3,598,387
SPRING END ASSEMBLY
Robert M. Webster, Jr., Emmaus, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.
Filed July 1, 1969, Ser. No. 838,191
Int. Cl. F16f *1/26*
U.S. Cl. 267—54 **7 Claims**



A spring end assembly for use in suspension systems of trucks and other vehicles including spring leaves of which two or more adjacent leaves are formed so that their end portions provide an enclosure or pocket for a rectangular spacer which is rotatably pinned to a spring bracket secured to the vehicle body. The pocket is closed by a bolt and spacer secured to the ends of the two leaves adjacent the rectangular spacer.

3,598,388
SPRING AND BEARING ASSEMBLIES
Archie John Hirst, 18 Saint Philips Road, Leicester, England
Continuation-in-part of application Ser. No. 633,509, Apr. 25, 1967, now abandoned. This application Dec. 31, 1969, Ser. No. 889,743
Int. Cl. B60g *11/24*
U.S. Cl. 280—57.1 **13 Claims**

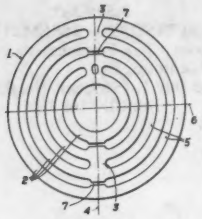


A combined spring and bearing assembly for a pivotal arm (e.g. for a motor vehicle wheel suspension) comprises a plurality of rubber spring sandwich units having a common attachment part disposed generally between the units and constrained to rotate under torsional load on the assembly to load the rubber in shear and in compression to give a rising load deflection characteristic for pivotal movement of the arm.

3,598,389
SPRING DISC FOR A MULTIRING VALVE
Robert Kohler, Schongau, Lech, Upper Bavaria, Germany, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria
Filed Jan. 28, 1969, Ser. No. 794,692
Claims priority, application Austria, Jan. 31, 1968, A940/68
Int. Cl. F16f *1/34*
U.S. Cl. 267—161 **7 Claims**

A spring disc for a multiring valve, the disc having concen-

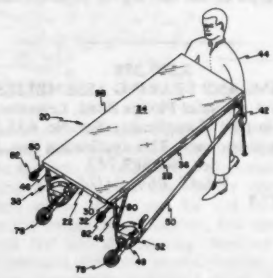
tric disc rings connected together by radial webs, all webs being arranged substantially on one diameter of the spring disc, while the disc itself is curved.



3,598,390
ADJUSTABLE WORK TABLE

Firth Kay Armitage, 3317 South 3130 East, Salt Lake City, Utah

Filed Oct. 15, 1969, Ser. No. 870,002
Int. Cl. B23g *3/06*
U.S. Cl. 269—17 **9 Claims**



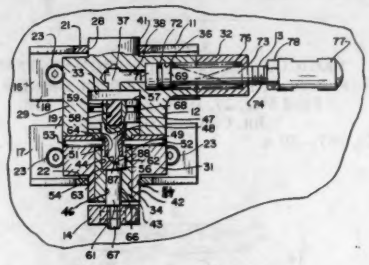
Apparatus for preparing wall covering prior to placement of the wall covering on a wall, the apparatus having a laterally expandable frame and a plurality of work surface panels removably mounted upon the frame. The frame can be oriented in either a generally horizontal or an upright position disposed at any one of a plurality of angles with respect to the vertical. Wheels mounted upon one end of the frame accommodate lateral movement of the apparatus when the frame is in the upright orientation and are restrainable so that in the upright orientation, the apparatus can be easily displaced in only a side-to-side direction. A guide for the wall covering dispenses wall covering over the assembled work surface segments at a controlled rate.

3,598,391
WORK HOLDING FIXTURE

Otis L. Butler, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 20, 1969, Ser. No. 867,616
Int. Cl. B23q *3/08*
U.S. Cl. 269—23 **5 Claims**

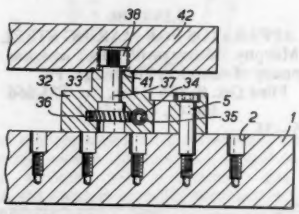
A hydraulic work-holding fixture is arranged and constructed such that initial arcuate movement of an operating lever is effective to swing a work-engaging plunger into a predetermined plane for alignment with a workpiece, while further arcuate movement is effective to hydraulically extend the plunger for engagement with the workpiece, the plunger is automatically retracted unless the device is fully actuated; an elastically deformable member exposed to fluid within the device provides variation in the extension of the plunger in order to accommodate tolerances in the workpiece.



3,598,392
FIXING DEVICES

David T. N. Williamson, and Peter G. Davis, both of Deptford, London, England, assignors to Molins Machine Company Limited, London, England

Filed Aug. 13, 1968, Ser. No. 752,390
Claims priority, application Great Britain, Aug. 22, 1967, 38,579/67
Int. Cl. B23q *3/06*
U.S. Cl. 269—47 **2 Claims**



A method and apparatus for securing a workpiece to a support by a fixing device having a portion of noncircular cross section capable of entering a hole of noncircular cross section in the workpiece and rotatable to grip against a sidewall of the hole or recess. The fixing device is retained by, and may be mounted in, the support which may be fixed to a pallet.

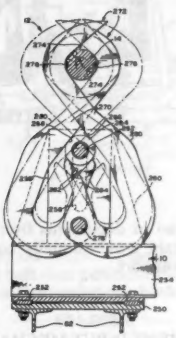
3,598,393
POLE-BORING MACHINE

Milton H. Mater, 1415 Brook Lane, Corvallis, Oreg.

Division of Ser. No. 672,064, Oct. 2, 1967, Pat. No. 3,502,124.
This application July 18, 1969, Ser. No. 843,043
Int. Cl. B25b *1/08*
U.S. Cl. 269—234 **2 Claims**

A pair of aligned drills each includes a drill tube carrying a drill bit including a forward pilot pin, forward cutters of a smaller diameter and rearward cutters of a larger diameter. The drill tube is rotated and drills an axial hole in a pole slightly larger than a guide tube, which extends to a point just behind the rearward cutters and journals the drill tube. Pressurized air fed into the guide tube through a rotary coupling travels through a venturi passage at the forward end of the guide tube and carries chips from the drill bit back through the drill tube. The guide tube is rotated slowly to dislodge chips and facilitate movement of the guide tube into the bore being formed. A carriage slidable on tubular ways and guides slidable on the ways support the guide tube and is moved forwardly slowly by a cable drive to feed the drill and is

returned rapidly by the cable drive. The drills are moved forwardly from opposite ends of the pole to be drilled until one drill reaches the end of its feed stroke and then this drill is retracted while the other drill completes its stroke. A slidable interlock prevents the drills from coming together and reverses the motion of the carriage of one of the drills when the



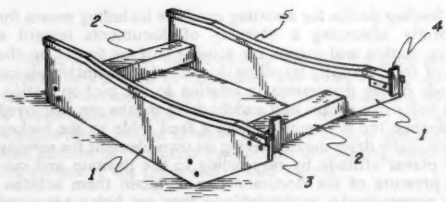
drills closely approach each other. Opposed clamps having generally V-shaped jaws on the ends of tongs grip and center the pole relative to the drills. The rotary coupling forms pressuretight seals both with the drill tube and the guide tube. Spiders in the guide tube mount ball bearings journaling the drill tube and permit flow of air along the space between the drill tube and the guide tube.

3,598,394

TELEVISION REPAIR HOLDER

Leo C. Miller, 11110 Dodson Lane, Wheaton, Md.

Filed July 28, 1969, Ser. No. 845,453
Int. Cl. B23q *3/00*
U.S. Cl. 269—296 **8 Claims**



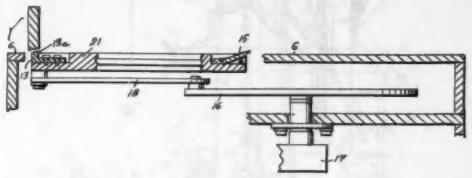
The present invention relates to a device capable of supporting a table-size television set, or other device of similar size and weight distribution, in two positions advantageous to the performance of service and adjustment operations. More specifically, the proposed support device includes a pair of rail members which are arranged in parallel, spaced-apart relationship. One edge of these rail members is slightly concave, to conform to the convex shape of the television picture-tube or safety mask; whereas, the opposite edge of these rail members is angled so as to support the television set in at least two distinct servicing positions. Additionally, the concave edges are covered by a protective strip, and a metal angle bracket is attached to the angled end of each rail to support the bottom of the television set during repair operations.

3,598,395

EDUCATIONAL TESTING APPARATUS

Nicholas J. Carriero, Churchville; Lawson F. Narvell, Port Deposit, and Fred N. Newcomb, Kingsville, all of, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 24, 1968, Ser. No. 770,186
Int. Cl. B65h *3/24, 3/44*
U.S. Cl. 271—3 **3 Claims**



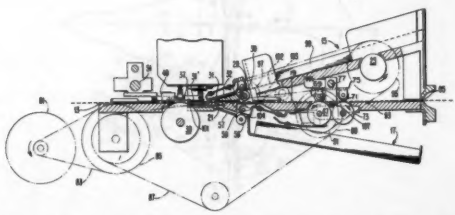
For educational and student testing purposes, questions are printed on question punchcards and the student records his answers on answer cards. The cards are then moved on to a receiving hopper and new cards are presented before the student with a new question for him to answer on a corresponding answer card.

3,598,396

RECORD CARD HANDLING DEVICE WITH MULTIPLE FEED PATHS

Donald R. Andrews, Lexington, Ky., and Larry H. Robbins, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1969, Ser. No. 831,948
Int. Cl. B65h *1/06*
U.S. Cl. 271—9 **5 Claims**



A record card handling device incorporating multiple feed paths for automatic and manual card feeding operations and multiple feed paths for automatic and manual card ejection operations. Cards are automatically fed from a card hopper over a first feed path or from a manual entry station over a second feed path to a card transport for data processing operations. Cards are ejected from the card transport to a card stacker over a third feed path or to the manual entry station over the second feed path in accordance with the operation specified. Each of the feed paths are vertically oriented with respect to one another. A card-sensing device coacts with the card-feeding means to insure cards cannot be entered onto the transport through the manual entry station when a card is present on the card transport and is further utilized to control card motion on the card transport.

3,598,397

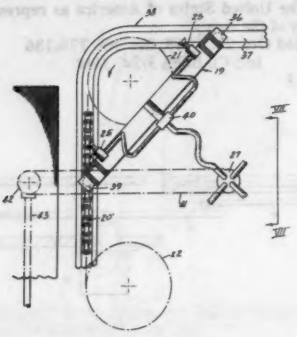
SHEET FEEDER

Roland Preisig, Lausanne, Switzerland, assignor to J. Bobst et Fils S.A.

Filed June 13, 1969, Ser. No. 833,118
Claims priority, application Sweden, June 13, 1968, 9140/68
Int. Cl. B65h *5/08*
U.S. Cl. 271—12 **10 Claims**

Sheet feed mechanism particularly adapted to pick off individual sheets from vertical stock of such sheets one at a

time and carry them to and deposit them in a horizontal position. The sheet feed apparatus comprises a flat sucker unit

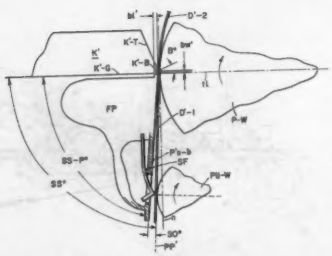


which is carried by a pair of endless chains which, in turn, are trained over a series of sprockets.

3,598,398
DOCUMENT FEED ASSEMBLY

Richard W. Carman, Foxboro; Vince G. Dempsey, Framingham Centre, and St. John Merrill Hall, Jr., Sharon, all of, Mass., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 2, 1968, Ser. No. 695,210
Int. Cl. B65h *1/08*
U.S. Cl. 271—39 **8 Claims**



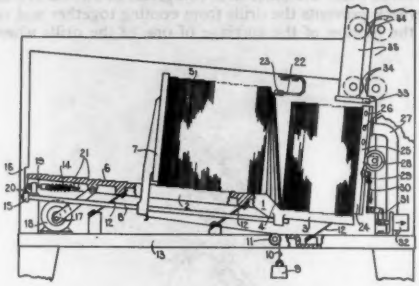
In a unit-record handling apparatus, an improved record injection and separation combination comprising, in a preferred embodiment, improved throat-separating means including a "single-record" guiding bevel; improved stack-pusher means adapted to squeeze a record stack into the throat area and improved picker means including a "-floating" pusher wheel arrangement adapted to accommodate irregularities in the shape, the position and the size of the record stack engaged.

3,598,399
DOCUMENT FEEDING APPARATUS

Gordon Reginald Cottrell, Langford, England, assignor to International Computers Limited, London, England

Filed Mar. 12, 1969, Ser. No. 806,656
Claims priority, application Great Britain, Mar. 22, 1968, 13,954/1968
Int. Cl. B65h *1/02*
U.S. Cl. 271—62 B **6 Claims**

Apparatus is disclosed for feeding documents. The apparatus includes a feed bed having an upper and a lower part connected by a step. Documents are fed along the feed bed from the upper part to the lower part. Positioned above the step is a holdback member which engages the top edge of the leading document on the upper part of the feed bed. Thus the combined action of the step and the holdback member is

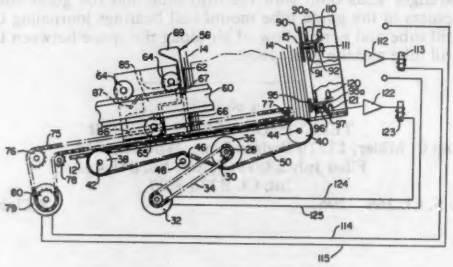


to allow a trickle feed of documents from the upper to the lower part to maintain a substantially constant number of document on the lower part.

3,598,400
DOCUMENT INPUT MECHANISM

Carl R. Nelson, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed June 16, 1969, Ser. No. 833,554
Int. Cl. B65h *7/02*
U.S. Cl. 271—62 B **23 Claims**



A feeding device for a sorting machine including means for uniformly advancing a plurality of documents toward a pickup station and means for sensing surface forces on the face of the forwardly traveling document to maintain planar attitude of the documents in relation to the pickup station. Both belt drive means and paddle drive means are employed to advance the documents along a feed table to the pickup station, each drive means having its own element for sensing such planar attitude by responding to the position and surface pressure of the documents to maintain them substantially perpendicular to the table as they are being advanced and to present these documents at the pickup station in parallel fashion. The sensing elements include upper and lower sensing arms contactable with the face of the forward document for detecting forces existing at the upper and lower portions of the forward document. Each arm independently energizes its individual drive means for controlling the rate of document advancement.

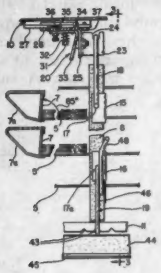
3,598,401
SHEET JOGGING DEVICE

Donald L. Snellman, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Feb. 24, 1969, Ser. No. 801,624
Int. Cl. B65h *31/38*
U.S. Cl. 271—89 **6 Claims**

A foam rubber belt is mounted adjacent the plurality of shelves of a collator bin. Sheets of paper fed into the shelves

contact the belt and are deflected backward against a restraining member or backstop. The belt is pivotally mounted at both ends by double pivot joints to enhance belt



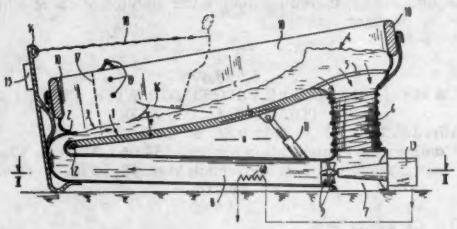
vibrations caused by the impact of the moving sheets with the belt. The vibrating belt thus performs the sheet-jogging function by urging the sheets against the backstops.

3,598,402

APPLIANCE FOR PRACTICING AQUATIC SPORTS

Otto Frenzl, 11, Avenue Foch, Pavillon 41, 77 Dammarie-Les-Lys, France

Filed July 1, 1968, Ser. No. 741,473
Claims priority, application France, Aug. 11, 1967, 117,810
Int. Cl. A63g *31/16*
U.S. Cl. 272—17 **18 Claims**



An appliance for the practicing within a reduced area of aquatic sports such as surf-riding and water-skiing, said appliance including a vat the bottom of which is sloping and has a longitudinal section which shows a concavity facing upwards while a stream of water is caused to flow upslope over said bottom as produced by a nozzle discharging water onto the surface of the lower end of said bottom.

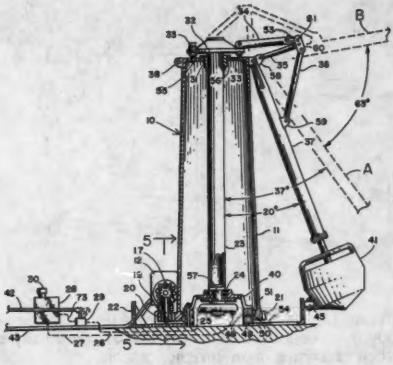
3,598,403

AMUSEMENT RIDE ROTATING ABOUT VERTICAL AND HORIZONTAL AXES

Norman Bartlett, North Miami Beach, Fla., assignor to Marjorie Bartlett, North Miami Beach, Fla., a part interest

Filed May 23, 1969, Ser. No. 827,364
Int. Cl. A63g *1/28*
U.S. Cl. 272—36 **3 Claims**

A rotating amusement ride having a vertical hollow column carrying a plurality of arms pivoted at one end to the top portion of the column with passenger cars secured to the ends of the arms. Power means rotates the column and swings the passenger cars about a vertical axis and maintains the cars a short distance away from the column. An inner shaft which rotates with the column is provided with a disc on which a plurality of pivoted posts are mounted with a linkage and struts connecting the pivoted posts with each of the arms and a brake mounted on the inner shaft to momentarily retard the rotation of the shaft and the disc to actuate the



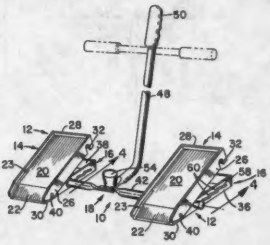
linkages and cause the upward swinging movement of the arms and cars as they rotate about the column.

3,598,404

EXERCISING APPARATUS INCLUDING PIVOTALLY CONNECTED WEIGHT-SUPPORTING UNITS

George E. Bowman, 4631 W. 189th, Country Club Hills, Ill.

Filed July 7, 1969, Ser. No. 839,174
Int. Cl. A63b *23/04*
U.S. Cl. 272—57 D **9 Claims**



Calf-exercising apparatus including a unit for each leg, with each unit including a foot-engaging platform for supporting the weight of the user. The elevational and lateral angles of each platform are independently adjustable, so that the attitude of each platform can be varied and controlled, and thereby provide a wide range of settings whereby the user can selectively choose the degree of difficulty and amount of stress that is required to perform the exercises. The foot-engaging platforms are provided on separate units that are pivotally connected to one another, and the structures are collapsible to a relative compact form for convenience of storage.

3,598,405

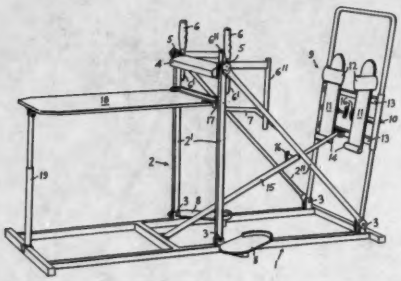
STATIC EXERCISING DEVICE FOR THE HUMAN BODY

Harry Burns, Epping, Essex, England

Filed June 10, 1968, Ser. No. 735,863
Claims priority, application Great Britain, June 12, 1967, 27,532/67
Int. Cl. A63b *21/02*
U.S. Cl. 272—58 **8 Claims**

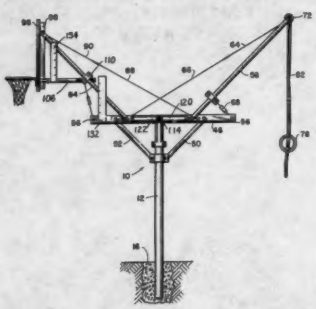
This invention relates to a static exercising device for the human body, which, in use, does not rely upon any moving parts. The device includes a base carrying a raised pelvic support member, foot-locating means, and a body support surface, which enable the execution of exercises in a prone or

semiprone position. The pelvic support member also defines part of a raised, upwardly and downwardly opening, open-



work frame for locating and stabilizing the pelvic region of the body in directions transversely and longitudinally of the base when exercising in an upright position.

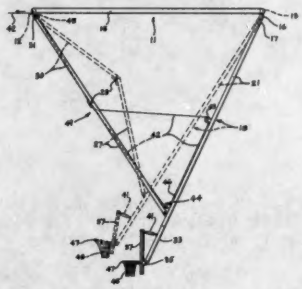
3,598,406
GYMNASTIC APPARATUS
Edward J. Robinson, P.O. Box 398, Velma, Okla.
Filed Feb. 15, 1968, Ser. No. 705,700
Int. Cl. A63b *1/00, 7/04, 63/04*
U.S. Cl. 272—61 **10 Claims**



A gymnastic apparatus having a pair of spaced parallel upright posts, each post having a horizontally extending crossmember independently secured thereto at the upper end of the post. The crossmembers are in substantially coplanar alignment, and together with the upright posts form a pair of parallel T-shaped members. A plurality of spaced horizontal bars are interposed between the crossmembers and are connected at the opposite ends to the crossmembers. The crossmembers and spaced bars thus form a horizontal ladder for exercising. The crossmembers and upright posts provide a common support structure for a plurality of exercising devices, including a punching bag and heavy training bag, each secured at opposite sides to the crossmembers and a basketball backstop and a climbing rope each secured to the outer ends of, and held in place by, a pair of upwardly and outwardly inclined bars whose inner ends are secured to the crossbars at opposite ends of the device. Each upright post is adjustable with respect to its height.

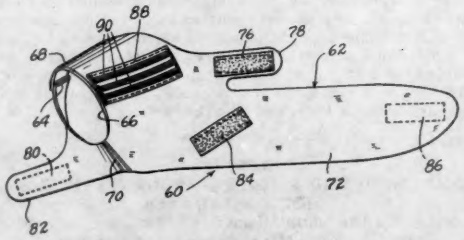
3,598,407
BACKBOARD-MOUNTING STRUCTURE
Eugene M. Sorensen, Lake Forest, Ill., assignor to Sorensen-Christian Industries, Inc., Angier, N.C.
Filed June 17, 1968, Ser. No. 737,559
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 R **2 Claims**

A basketball backboard is supported at the lower end of a first generally downwardly and forwardly inclined superstructure. The first superstructure is mounted at its upper end for pivotal movement. Hingedly connected to the superstructure adjacent to the backboard is a second generally upwardly and forwardly inclined superstructure, or brace member, having a knee joint. The upper end of the brace member is also mounted for pivotal movement. A first pulley is mounted adjacent the upper mounting point of the brace member, a second pulley is mounted on the first superstructure adjacent the mounting point of the brace member, and a third pulley is mounted to the first superstructure at about the level of the knee joint in the brace member. A cable extends from a



takeup device, over the first pulley, along the brace member, around the second pulley, along the first superstructure, around the third pulley, and is fastened to the brace member adjacent the knee joint. A stop member is mounted on the cable between the second and third pulleys. On takeup, tension along the full length of the cable causes the knee joint to break and starts raising the backboard. When the stop member engages the second pulley it changes the effective point of attachment from adjacent the knee joint to the second pulley, thereby reducing the amount of cable which needs be taken up.

3,598,408
WRISTLET AND WEB PROTECTOR WITH ATHLETIC ITEM ENGAGING PAD
Alfred P. Klose, 2736 Sidney St., St. Louis, Mo.
Continuation of application Ser. No. 554,067, May 31, 1966, now abandoned. This application Mar. 18, 1970, Ser. No. 20,818
Int. Cl. A63b *71/14*
U.S. Cl. 273—54 B **1 Claim**

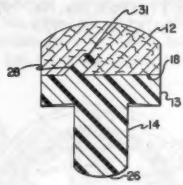


A wrist strap-type device which is an aid in sports comprising an elongated main body having a portion for wrapping around a wrist and a portion for covering the palm of a wearer, a thumb aperture at one end of the body, a tab portion extending from the body beyond the thumb aperture and a second opposed tab portion paralleling the main body intermediate its ends, securing means for holding the palm portion in position, separate securing means for holding the palm portion in position, and a selected pad secured to and within the area of the palm portion for engaging a bowling ball, golf club, and the like.

3,598,409
INTEGRAL BILLIARD CUE TIP AND BACKING MEMBER

Irvin Stephan Nemecek, Chicago, Ill., assignor to Kieckhefer Manufacturing Corporation, Chicago, Ill.

Filed Aug. 26, 1968, Ser. No. 755,067
Int. Cl. A63d *15/12*
U.S. Cl. 273—70 6 Claims

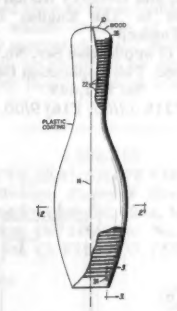


An integral billiard cue tip and backing member wherein the backing member is provided with one or more locking studs which are respectively fixed within one or more cavities in the tip. In forming the integral cue tip and backing member, at least one cavity is formed in the tip and a molten plastic is then injected into said cavity simultaneously while forming the backing member.

3,598,410
FILAMENT WOUND STRUCTURE AND METHOD OF MAKING SAME

Nick Costopoulos, Hartville, Wyo., assignor to Darrell L. Offe, Salt Lake City, Utah and William R. Jones, Wheatland, Wyo., part interest to each

Filed Feb. 11, 1969, Ser. No. 798,306
Int. Cl. A63d *9/00*
U.S. Cl. 273—82 R 25 Claims



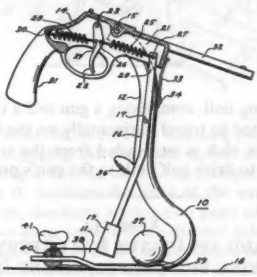
A wooden bowling pin core has a continuous helical groove cut into the surface thereof. The groove begins near the bottom of the core, has a smooth transition between its sides and its bottom spirals upwardly about the pin at about 10 revolutions per inch and terminates near the top of the core. A nylon roving filament comprised of a plurality of individual unbonded fibers is fastened at the lower end of the groove and wound therein around the pin at about 30 pounds of tension until it reaches the top portion of the groove where it is fastened. The ratio of the cross sectional area of the groove to the cross sectional area of the thusly wound filament is about 0.55. The filament fibers are not bonded nor is the filament itself bonded to the surfaces of the groove. Hence, when stressed, the filament and its fibers are permitted to undergo limited sliding motion within the groove. In this manner, impact on any portion of the pin is more evenly distributed so as to result in a considerable increase in pin life.

If desired, after the filament is wound and fastened, it is annealed at about 150° F. and then permitted to cool. The entire structure is then dipped in a suitable plastic coating material of a type having a limited tendency toward chemical or other bonding with the filament. The coated pin is then fitted with a conventional nylon sleeve or tube having a predetermined denier fineness gradient. If desired, this sleeve can also be annealed at about 150° F.

3,598,411
APPARATUS FOR PLAYING MINIATURE GOLF

Henry E. Lippert, 130 S.W. Twelfth St., Miami, Fla.

Filed July 28, 1969, Ser. No. 845,309
Int. Cl. A63b *71/00*
U.S. Cl. 273—129 5 Claims

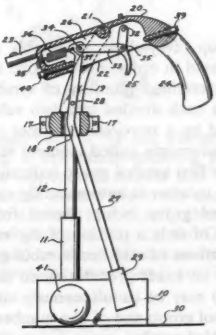


A stand, comprised of a unitary base and upright stem portion, pivotally mounts a gun which has its trigger operatively connected to a golf club also pivotally carried by the stand, and the club is adapted to drive golf balls to the gun's point of aim.

3,598,412
APPARATUS FOR PLAYING MINIATURE GOLF

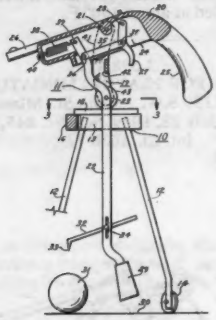
Henry E. Lippert, 130 S.W. Twelfth St., Miami, Fla.

Filed July 31, 1969, Ser. No. 846,458
Int. Cl. A63b *71/00*
U.S. Cl. 273—126 7 Claims



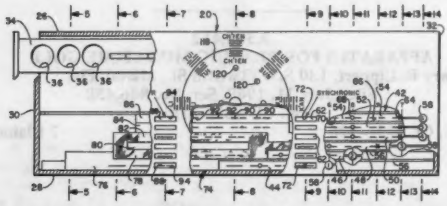
An extendable boom, that can swing in a horizontal plane, universally mounts a suspended golf club and related gun, so that the club and gun unit can swing in any direction. The club is actuated by the trigger of the gun and is adapted to drive golf balls to the gun's point of aim.

3,598,413
APPARATUS FOR PLAYING MINIATURE GOLF
Henry E. Lippert, 130 S.W. Twelfth St., Miami, Fla.
Filed Aug. 13, 1969, Ser. No. 849,691
Int. Cl. A63b 71/00
U.S. Cl. 273—129 10 Claims



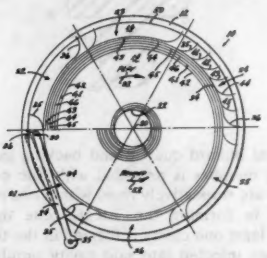
A ball driving unit, comprising a gun and a trigger-actuated club, is mounted to travel horizontally on the top of a rotatable stand. The club is suspended from the top of the stand and arranged to drive golf balls to the gun's point of aim.

3,598,414
METHOD AND APPARATUS FOR DETERMINING AND STUDYING PHILOSOPHICAL AND ORACLE RESPONSES
Khigh Alx Dhiegh, Los Angeles, Calif., assignor to William L. Seay, Los Angeles, Calif. and Jere Bayard, Los Angeles, Calif., part interest to each
Filed Jan. 9, 1969, Ser. No. 790,068
Int. Cl. A63f 9/18
U.S. Cl. 273—161 16 Claims



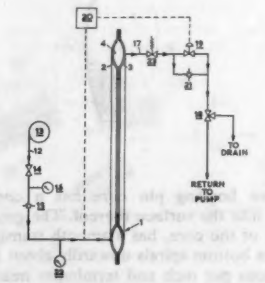
A first group of symbols, preferably six, are individually visually indicated in order, each of said symbols being taken from a predetermined plurality of symbols, preferably two basic symbols each divided into two subsymbols, preferably as determined by a previous set order of determination including the commonly called element of chance. Simultaneously with the first symbol group indication, a second symbol group of like number is automatically visually indicated, the second symbol group being altered from the first symbol group by use of only a portion of the same individual basic symbol indications of said first symbol group, but the alteration being in an exact predetermined manner. Also, a third symbol group may be simultaneously visually indicated with the first symbol group and of like number, certain of the symbols of the third symbol group being altered from the basic symbols of the first symbol group where said first group symbols are of particular subsymbol forms and not being altered when said first group symbols are not of said particular subsymbol forms. The apparatus may include interconnected first, second and third group slides simultaneously and automatically carrying out the predetermined symbol conversions or alterations upon the mere setting of the first group indicating slides, all of said group slides visually indicating the symbols of that particular group through windows of an apparatus frame.

3,598,415
RECORD FOR USE IN A SOUND-REPRODUCING DEVICE IN A TOY OR THE LIKE
William F. Summerfield, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 17, 1969, Ser. No. 792,111
Int. Cl. G11b 3/78
U.S. Cl. 274—42 R 8 Claims



A record for use in a sound-reproducing device in a toy or the like, the record having a circular surface defining a plurality of congruent spiral sound grooves. Surrounding the circular surface is a ringlike annular surface, divided into a plurality of annular sectors, each defining a plurality of radial lead-in grooves, all of which are in communication with an arcuate lead-in groove which is in turn in communication with the outer convolution of a different spiral sound groove.

3,598,416
FLEXIBLE BELLOWS ARRANGEMENTS
Frederick Ernest Stock, Winnipeg, Manitoba, Canada; Keith Norman Hitchcock, and Geoffrey Bernard Thomas, Rugby, England, assignors to The English Electric Company Limited, London, England
Continuation-in-part of application Ser. No. 692,116, Dec. 20, 1967, now abandoned. This application Oct. 10, 1969, Ser. No. 871,449
Int. Cl. F21b 33/00; F16j 9/00, 15/00
U.S. Cl. 277—2 10 Claims



In order to detect perforation of a flexible seal provided between two relatively movable members, the seal includes a flexible bellows arrangement comprising a pair of flexible walls defining between them a tubelike enclosure and each extending between the members, and means is provided for feeding a fluid through the enclosure monitoring means being provided for detecting a change in a parameter of the fluid flow whereby to indicate leakage of fluid through one of the walls. The monitoring means may be sensitive to pressure or flow rate.

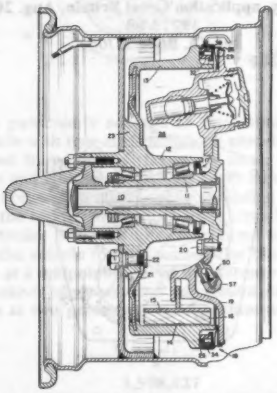
Where the seal separates two regions at different pressures, the pressure within the enclosure may be an intermediate

value. Thus by detecting whether fluid leakage is occurring into or out of the enclosure it is possible to conclude which wall has been perforated.

3,598,417
NONFRICTION SEAL

Peter A. Mueller, Oak Park, Ill., assignor to Mueller Seal Company, Lyons, Ill.

Continuation-in-part of application Ser. No. 748,131, July 15, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 600,418, Dec. 9, 1966, now abandoned. This application June 19, 1969, Ser. No. 843,893
Int. Cl. F16j *15/16, 15/40*
U.S. Cl. 277—74 **7 Claims**

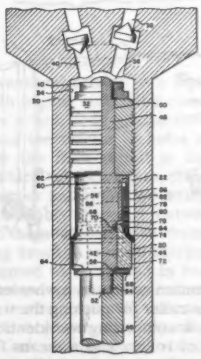


A seal comprising mating parts yieldably biased to mutual sealing contact but including means for introducing fluid under pressure between said parts to separate said parts, to establish a flowing-fluid barrier against entry of foreign materials between said parts and to establish and maintain a superatmospheric pressure in a chamber bounded by said parts. In a preferred form of the invention, one of said mating parts is a lipped washer capable of a hinging action and readily removably supported in the assembly. In some applications means may be provided for periodically scavenging from said chamber fluent material which may accumulate therein.

3,598,418
SLEEVE SEAL SHAPE CONTROL

John R. Ward, Owings; Harry J. Skruch, Baltimore, and Joseph H. Morris, Stevensville, all of, Md.

Filed Sept. 30, 1969, Ser. No. 862,200
Int. Cl. F16j *9/06, 15/00*
U.S. Cl. 277—165 **4 Claims**

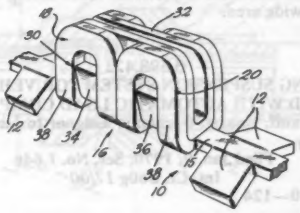


An apparatus for controlling the curved or contoured ends of sleeve seals by altering the natural belled shape of the seal to thereby obtain the desired seating and sealing pressures.

3,598,419
RING LATCHES

Kenneth J. Nisper, Spring Lake, and Robert Lakanen, Muskegon, both of, Mich., assignors to Muskegon Piston Ring Company, Muskegon, Mich.

Filed July 22, 1969, Ser. No. 843,592
Int. Cl. F16j *9/12*
U.S. Cl. 277—219 **11 Claims**

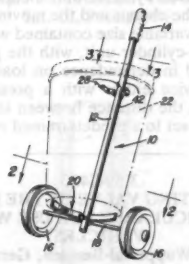


A latching device for accurately abutting parted ends of a piston ring by engaging the expander-spacer of the ring, the device comprising a flexible molded or stamped body dimensioned so as to fit between the sides of the expander-spacer adjacent the part, the body having two pairs of ears projecting outwardly so as to engage said adjacent sides of said ring in their openings, but not so far as to extend out beyond the faces of the sides of the expander-spacer.

3,598,420
GARBAGE CAN CARRIER

Jules Edlin, 330 East 59th St., New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 857,447
Int. Cl. B62b *1/06*
U.S. Cl. 280—47.24 **4 Claims**



A carrier for garbage cans or the like comprising an elongated post including a can-handle-grasping pair of hooks mounted toward the upper end thereof and a can-seating straplike cradle mounted toward the lower end thereof. An elongated wheel axle extends transversely through the post and the post-mounted portion of the cradle. Ground-engaging wheels are mounted on the outer extremities of the axle whereby a rolling support for the carrier is provided.

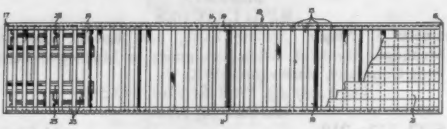
3,598,421
PLATFORM TRAILER

Wylie A. Mason, Jr., Thousand Oaks, Calif., assignor to Wells Industries Corporation, North Hollywood, Calif.

Filed July 17, 1968, Ser. No. 745,553
Int. Cl. B62d *21/02*
U.S. Cl. 280—106 **6 Claims**

The present disclosure pertains to a platform trailer having a plurality of crossbeams and torque tubes adjoined between

a pair of elongated side rails so as to provide a load path between parallel hard points on each side of the trailer thereby, absorbing the bending and torsional loads acting



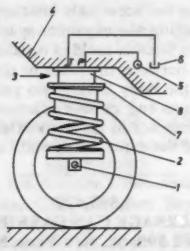
thereon. The trailer also has a kingpin supported by a plurality of bars to distribute any inertial loads acting on the kingpin over a wide area.

3,598,422

SPRING SUSPENSION SYSTEM FOR VEHICLES PROVIDED WITH AUTOMATIC LOAD COMPENSATION

Gunter Strauff, Kaarst, Germany, assignor to Langen & Co., Germany

Filed Jan. 9, 1970, Ser. No. 1,646
Int. Cl. B60g *17/00*
U.S. Cl. 280—124 **6 Claims**



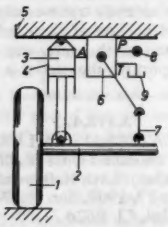
A resilient suspension assemblage for vehicles provided with automatic load compensation means in which a compression spring operably connected with a wheel axle or guide rail is related to the vehicle chassis via the moving component of a piston-cylinder unit including a fixed component secured to the chassis and the moving component and a liquid cushion of variable size contained within the pressure space of the piston-cylinder unit, with the pressure chamber being so connected in dependence on load variations via a level-regulating device either with a pressure source or a drain or outlet that the distance between the chassis and the axle or guide rail is set to a predetermined value.

3,598,423

LEVEL-REGULATING VALVE OF THE PISTON VALVE TYPE PARTICULARLY FOR USE WITH ROAD VEHICLES

Willi Clarenbach, Wuppertal-Barmen, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Feb. 11, 1969, Ser. No. 798,359
Int. Cl. B60g *17/00*
U.S. Cl. 280—124 **8 Claims**



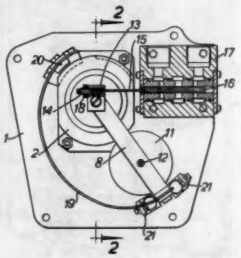
A level-regulating valve of the piston valve type for road vehicles which, in dependence upon the distance variations between sprung and unsprung bodies, connects a pressure space of an adjusting component positioned between such bodies in a first regulating position with a source of pressure, in a second regulating position with a discharge and in a third regulating position which corresponds to the level position of the vehicle a blockage of such connections with the distance variations being transmitted via linkages to the level-regulating valve.

3,598,424

CONTROL UNIT FOR VEHICLE SUSPENSIONS

Stephen J. Crouch; Peter W. R. Stubbs, and Michael W. Lewis, all of Warwick, England, assignors to The Rover Company Limited, Solihull, Warwickshire, England

Filed Aug. 19, 1969, Ser. No. 851,245
Claims priority, application Great Britain, Aug. 20, 1968, 39773/68
Int. Cl. B60g *21/06*
U.S. Cl. 280—124 F **7 Claims**



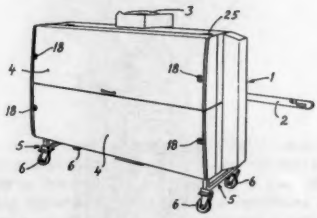
A control unit for an active vehicle suspension system of the kind in which hydraulic struts acting on the wheel suspension linkages are in series with springs and have hydraulic fluid fed to and from them in response to vehicle body movements comprises a pendulum device connected to a rotary damper which is in parallel with a spring. The body of the damper is rotatably mounted in bearings in a mounting plate for securing to the vehicle bodywork and adapted to be rotated by movements of the suspension linkage and the damper spindle carries the pendulum and acts on hydraulic valves controlling the fluid flow. The spring can be a leaf spring interconnecting the damper body and the pendulum.

3,598,425

WHEELED RACK

Bjerne Sollie, Jar, Norway, assignor to Wideroe Industri A.S, Oslo, Norway

Filed Apr. 15, 1969, Ser. No. 816,321
Claims priority, application Norway, Apr. 18, 1968, 1473/68
Int. Cl. B60v *27/00*
U.S. Cl. 280—150 A **3 Claims**



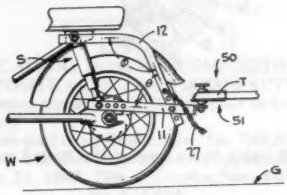
The present invention relates to a wheeled rack for mounting on the side of a trailer for pushing the trailer on edge during stowing, the rack comprising two identical members each having a plurality of rollers and a means for attachment to the frame of the trailer by means of a slidable rod which rigidly secures the frame to the trailer.

3,598,426

TRAILER HITCH FOR MOTORCYCLE

Nathan E. Spiese, East Petersburg, Pa., assignor to Wheel Mate Corporation, East Petersburgh, Pa.

Filed Oct. 29, 1969, Ser. No. 872,177
Int. Cl. B62k 27/00
U.S. Cl. 280—204 10 Claims



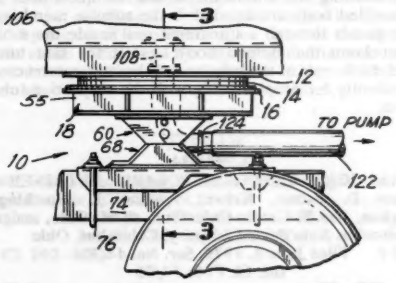
A hitch particularly adapted to fit a motorcycle or other sport vehicle with rear mounted shock absorbers is disclosed. A U-shaped frame extends forwardly along the sides of the rear wheel and is connected at the lower mount of the shock absorber. Forwardly and upwardly extending braces are connected to the top mounts for the shock absorber; shock loads from the trailer being thereby transmitted to the shock absorber of the vehicle for dissipation. The braces have an obtuse angle at a midpoint to avoid interference with the exterior of the shock absorbers and adjustment of the frame and the braces at two points allows adaptation to different vehicles.

3,598,427

LIQUID FIFTH WHEEL ASSEMBLY

James Owen Lavery, Setauket, N.Y., assignor to Garsite Products Inc., Deer Park, N.Y.

Filed Dec. 17, 1968, Ser. No. 784,394
Int. Cl. B60d 1/08
U.S. Cl. 280—421 28 Claims



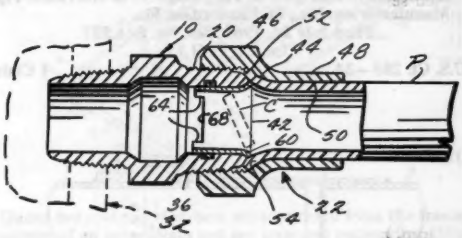
The present invention pertains to a liquid fifth wheel assembly for use with tractor and trailer combinations wherein the trailer includes a tank body for the storage and transportation of fluids, and the tractor includes a pumping station adapted to deliver the fluid stored in the tank. The fifth wheel assembly which is secured to the underside of the trailer comprises upper and lower mounting plates, an annular ball bearing assembly disposed between the mounting plates and secured therebetween, a subframe member having an upper mounting bracket secured thereto and descending therefrom and adapted to be placed in bearing secured engagement with a lower mounting bracket secured to the tractor, wherein the entire assembly has a central opening therein through which passes an enclosed pipe structure interconnecting the tank and the pump station; the pipe structure including a swivel joint for permitting rotational movement of the enclosed pipe.

3,598,428

PIPE COUPLING

John J. Smith; Lawrence F. Luckenbill, and Peter N. Cassimatis, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Continuation-in-part of application Ser. No. 708,314, Feb. 26, 1968, abandoned. Continuation-in-part of application Ser. No. 796,506, Feb. 4, 1969. This application Jan. 19, 1970, Ser. No. 3,841
Int. Cl. F16l 35/00
U.S. Cl. 285—3 25 Claims



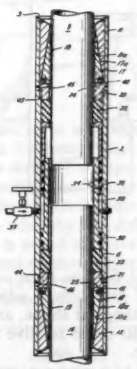
A pipe coupling for connecting an end of a pipe into a water distribution system while there is pressure on the system. The pipe may have either a flared end or a flareless end. The pipe coupling is provided with a temporary sealing means which allows initial connection of the pipe into the system so that delivery of water may be provided at a later time upon complete makeup of the coupling or after the elapse of a predetermined amount of time necessary to dissolve the temporary sealing means when the same is water soluble. If immediate delivery of water from the water distribution system to the pipe is desired, the coupling may be completely made up immediately so that the cutter means carried within the coupling is actuated to cause removal of the temporary sealing means.

3,598,429

HYDRAULIC COUPLING

James F. Arnold, P.O. Box 7197, Shreveport, La.

Filed Apr. 14, 1969, Ser. No. 815,831
Int. Cl. F16l 35/00
U.S. Cl. 285—18 8 Claims



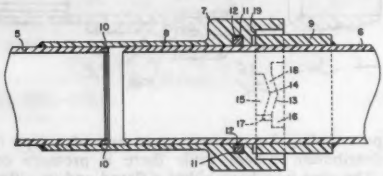
The coupling disclosed includes a housing for sliding over the end of a pipe length. Fluid under pressure is introduced into the housing to act against a piston therein. The piston moves axially of the housing and forces slips into gripping engagement with the pipe and compresses packing between the piston and the slips into sealing engagement with the housing and the pipe. When the coupling is to connect two pipe sections together or to repair a leak in one pipe section, two pistons are employed. The pistons move in opposite

directions under the influence of fluid pressure, force-opposed sets of slips into engagement with the two pipe sections, and compress packing elements between each piston and its associated slips into sealing engagement with the outside surface of the two pipe sections or the outside surface of the pipe being repaired on opposite sides of the leak, if the coupling is being used for that purpose.

3,598,430
PIPE CONNECTOR

Daniel J. Maher, Fort Lauderdale, and Robert W. O'Halloran, Hollywood, both of, Fla., assignors to Hurricane Pipe Manufacturing, Inc., Ft. Lauderdale, Fla.

Filed July 24, 1969, Ser. No. 844,537
Int. Cl. F16l *35*
U.S. Cl. 285—24 **1 Claim**

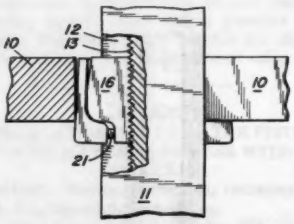


A pipe connector in which a section of the connector is attached to the ends of each of two pieces of pipe and in which the ends are locked together by turning the two sections relative to each other.

3,598,431
ADJUSTABLE WEDGE CONSTRUCTION

Joseph Giambalvo, 1118 Willoughby Ave., Brooklyn, N.Y.

Division of Ser. No. 790,293, Jan. 10, 1969, Pat. No. 3,545,387, which is a continuation-in-part of application Ser. No. 659,937, July 28, 1967, now Patent No. 3,437,060. This application May 14, 1970, Ser. No. 37,270
Int. Cl. F16b *12/20*
U.S. Cl. 287—20.3 **5 Claims**



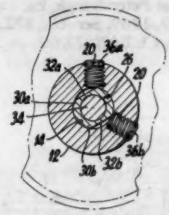
An adjustable wedge for use in adjustable furniture construction made up of two halves adapted to pivotally fit together to form a rectangular shape, and an adjusting screw adapted to be turned to cause relative rotation between the halves to form a wedge.

3,598,432
HUB CLAMP

Melvin F. Walker, Dix Hills, N.Y., assignor to Designatronics, Inc., Mineola, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,765
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.04 **4 Claims**

A bushing, having a deflectable tab provided with a flatted portion on the outside surface thereof, is inserted in the bore of a rotatable hub and is brought into gripping engagement with a shaft by means of a setscrew which extends through

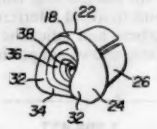


the hub and which bears against the flatted portion of the deflectable tab.

3,598,433
MOLDED PLASTIC FITTING

Anthony P. Savickas, 2713 N.E. 27th Ave., Pompano Beach, Fla.

Filed Sept. 16, 1969, Ser. No. 858,329
Int. Cl. F16b *7/00*
U.S. Cl. 287—54 C **2 Claims**

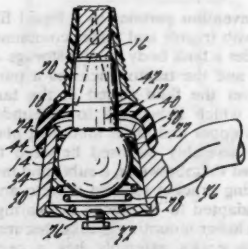


A molded plastic fitting particularly useful for joining together two tubular members. The fitting is a generally cylindrical molded plastic body having first and second ends, the first end being recessed axially to fit the outside of one tubular member, and the second end being radially inwardly offset from the first end by a circumferential step and dimensioned to fit inside the end of the other tubular member with the step abutting that end of the tubular member. Both ends of the molded body are bonded to the tubular members. A fastener passes through a transverse wall inside the molded body to clamp the molded body against the first tubular member. Both ends of the tubular member are constructed to give resiliently for proper fitting with the respective tubular members.

3,598,434
BALL JOINT HAVING DISPOSABLE RETAINER

De Lane D. Patton, Keiser; William J. Worthington, Maughan, and B. Garth, Columbus, all of, Ohio, assignors to Columbus Auto Parts Company, Columbus, Ohio

Filed June 8, 1970, Ser. No. 44,304
Int. Cl. F16c *11/06*
U.S. Cl. 287—87 **8 Claims**



A ball joint for an automotive-steering linkage or the like which is assembled prior to its installation on a vehicle with a

special plastic retainer sleeved over the ball stud. The retainer protects the threads of the stud and holds the usual dust cover in place. The retainer is removed and discarded upon the installation of the ball joint onto the vehicle. The retainer has the shape of a tapered open-ended sleeve with internal ribs to grip the stud threads. The retainer is slotted at its opposite ends an has integral hinge portions between the slots so that the application of radial forces at one end of the retainer will produce opposite radial movement of the opposite end of the retainer.

3,598,435

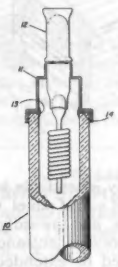
CERAMIC-METAL BONDING COMPOSITION AND COMPOSITE ARTICLE OF MANUFACTURE

Paul J. Jorgensen, Cupertino, Calif., assignor to General Electric Company

Continuation-in-part of application Ser. No. 749,069, July 31, 1968, which is a continuation-in-part of application Ser. No. 500,311, Oct. 21, 1965. This application Nov. 14, 1968, Ser. No. 825,086

Int. Cl. F16b *11/00*

U.S. Cl. 287—189.365 **11 Claims**



An improved seal or bond between a refractory metal body and a translucent alumina ceramic body is disclosed wherein the metal surface to be bonded to the alumina body is comprised of zirconium, either as a metallic coating thereon, diffused therein by "metalliding," as an alloying constituent, or as the major constituent of the metal body. The bond is effected by means of an alumina glass between the zirconium present at the surface and the adjoining alumina ceramic surface, at least a portion of the zirconium being oxidized by the molten glass during the formation of the seal.

3,598,436

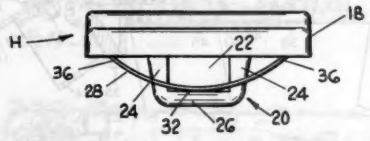
HASP

Stephen Salvatore Scelba, Clifton, N.J., assignor to Presto Lock Co., Inc., Garfield, N.J.

Filed Sept. 3, 1969, Ser. No. 854,834

Int. Cl. E05c *19/08*; **E05b** *65/52*

U.S. Cl. 292—283 **9 Claims**



A hasp cooperable wit a latching member of a latching device employs a convexly shaped spring member to automatically eject or separate the hasp from the latching device when the latching member is moved from latched to unlatched position. The spring member is formed with means for connecting it to the portion of the hasp adapted to receive the latching member in its latched position.

3,598,437

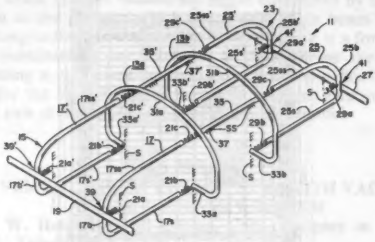
AUTOMOBILE COLLISION GUARD MEANS

Mary V. Montgomery Harris, 491 North Highlands Apt. 15, Memphis, Tenn.

Filed Aug. 6, 1969, Ser. No. 847,876

Int. Cl. B60r *19/08*

U.S. Cl. 293—62 **4 Claims**



Guard bar and rod members are supported from the frame structure of an automobile and are arranged outwardly of the skin of the automobile body at strategic impact-prone areas of the body. The guard structure includes crossbars extending over the top midsection of the automobile operative mainly for preventing damage in an accident overturning the automobile. The guard structure includes also a forward and a rearward guard rod assembly arranged respectively around the front cap and rear deck sections of the automobile and with each assembly being rigidly or resiliently mounted for cushioning impacts forwardly and rearwardly of the automobile.

3,598,438

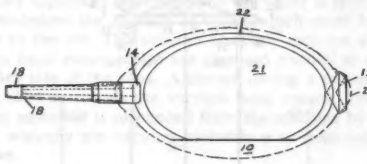
HOLDER FOR HOT CASSEROLE DISH

Edmund Taft, 703 Madison Ave., Daytona Beach, Fla.

Filed May 23, 1969, Ser. No. 827,430

Int. Cl. A47j *45/00*

U.S. Cl. 294—29 **2 Claims**



This specification discloses a holder for a hot dish. The holder is made up of a flat base with a loop on the front end to receive the end of a dish and a fingerlike member attached to a spring-loaded handle. The handle may be moved down to bring a finger attached to the handle into engagement with the inside of the dish whereby the dish is held positively to the base. The handle is urged to move with this finger away from the dish by a compression spring. A lug is fixed to the handle and the thumb of an operator can engage the lug and force the finger down into engagement with the dish.

3,598,439

LIFTING HEADS FOR PALLETIZERS

Ernst A. Dahlquist; Stanley J. Polakowski, and Teunis Vaalburg, all of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

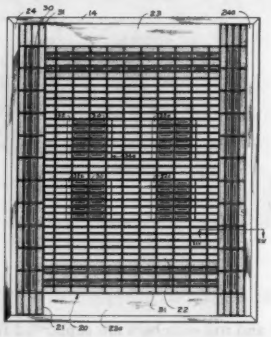
Filed Dec. 6, 1968, Ser. No. 781,823

Int. Cl. B66c *1/02*

U.S. Cl. 294—65 **10 Claims**

The invention is directed to a device of the type frequently used in palletizers for lifting, by air pressure differential, articles arranged in any of a number of different patterns. The

device consists of a head having a primary chamber from which the air is exhausted. The bottom of the primary chamber is formed by a grate creating a number of small individual air passages. A number of these individual openings are equipped with valves, each individually operable. These



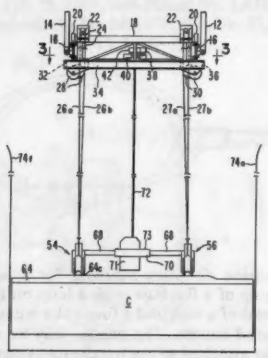
valves open and close in response to a predetermined amount of air pressure differential across the valve. The valves close to shut off the flow of air into the primary chamber through those individual air passages not closed off by the articles to be lifted.

3,598,440

ROTATABLE CONTAINER-HOISTING APPARATUS

Charles D. Ramsden, Alameda, and George W. Cooper, San Leandro, both of, Calif., assignors to Fruehauf Corporation, Detroit, Mich.

Filed Mar. 18, 1969, Ser. No. 808,183
Int. Cl. B66c *1/00*
U.S. Cl. 294—67 **5 Claims**



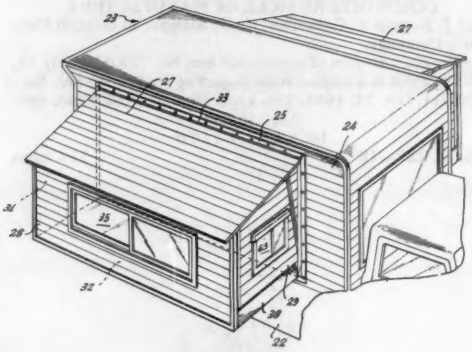
Hoisting apparatus for cargo containers that permits the containers to be oriented in any rotative position so that containers can be positioned as desired in container cells, on dock surfaces, and like locations. A cable guiding system in which the spacing between the several vertical cable runs in the system can be altered between a relative widely spaced, highly stable position and a relatively closely spaced position at which the cable guiding structure can enter into container cells without contacting the walls that define the cell. An auxiliary frame adapted to be mounted between the cable guiding structure and a conventional container-engaging spreader frame, which auxiliary frame is adapted to rotatively position a spreader frame and container engaged thereby. The auxiliary frame includes sensors to determine the degree of load imbalance, if any, of a container engaged thereby, and a counterweight and a drive system for the counterweight that positions the counterweight so as to compensate for any imbalance arising from an eccentrically loaded container.

3,598,441

WALL-MOUNTED EXTENDABLE BED

John H. Damiani, 15633 Arrow Hyw., Irwindale, Calif.

Filed July 18, 1969, Ser. No. 842,977
Int. Cl. B60p *3/38*
U.S. Cl. 296—23 **22 Claims**



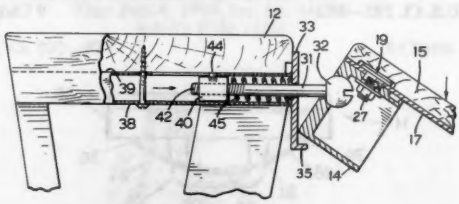
A foldable or exteriorly extendable bed and vehicle body construction comprised of a roof panel, which forms a part of the sidewall of the vehicle, and inwardly folding side and end panels interlocked to prevent entrance from the outside whether the bed is folded or extended, and with the unit preassembled into a frame and inserted as a unit into a frame opening in the sidewall of the vehicle and secured therein by screws or the like. Tension springs and torsion bars counterbalance the bed panels so that minimum force is required to operate them, and, if released, the unit will not continue a moving cycle to damage. A longitudinal hinge between the side and bottom panel is articulated to prevent binding of the parts and the loaded, extended bed is supported mainly through the end panel to stationary brackets.

3,598,442

COLLAPSIBLE TABLET ARM ASSEMBLIES

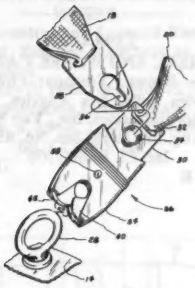
John William Miller, Toronto, Ontario, Canada, assignor to Canadian Seating Company Limited, Toronto, Ontario, Canada

Filed Aug. 6, 1969, Ser. No. 847,878
Int. Cl. A47b *39/00*
U.S. Cl. 297—162 **9 Claims**



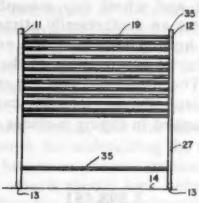
The invention provides a collapsible writing tablet arm pivotally attached to the arm of a chair, such as those commonly found in lecture halls. The tablet arm is movable from a position alongside and below the chair, to a horizontal writing position in front of the chair. When in its horizontal position, the tablet will deflect in any direction on application of excessive force to the tablet, and restore to its horizontal position on removal of the force.

3,598,443
SEAT BELT CONNECTOR
Robert W. Stoffel, Ferndale, Mich., assignor to Jim Robbins Seat Belt Co., Mt. Clemens, Mich.
Filed June 5, 1969, Ser. No. 830,735
Int. Cl. A62b *35/60*
U.S. Cl. 297—389 20 Claims



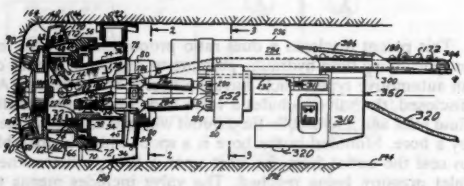
A seat belt assembly having a connector for releasably fastening a diagonally positioned shoulder belt to a lap belt, and both belts to a floor mounting fitting. The connector allows the user to either fasten or release the belts from their connection to the fitting as part of the same motion in which he positions or removes the belts from about his body.

3,598,444
BODY SUPPORTER
Sarah H. Seiter, c/o Adams, 20 Teton Court, Lafayette, Ind.
Filed Dec. 9, 1968, Ser. No. 782,016
Int. Cl. A47c *4/02, 7/00*
U.S. Cl. 297—440 9 Claims



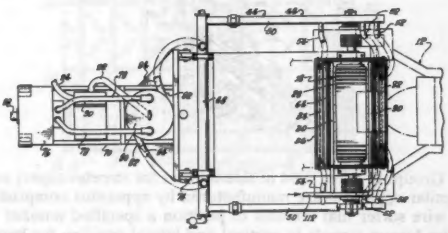
A pair of horizontally spaced rectangular members of plastic impregnated wood has a plurality of identical apertures in parallel horizontal and vertical rows and columns receiving dowel rods in apertures selected to form a seat and foot rest of desired size, location, and configuration.

3,598,445
TUNNEL-BORING MACHINE
Douglas F. Winberg, 9861 Vineyard Crest, Bellevue, Wash.
Filed May 8, 1969, Ser. No. 822,921
Int. Cl. E01g *3/04*
U.S. Cl. 299—31 19 Claims



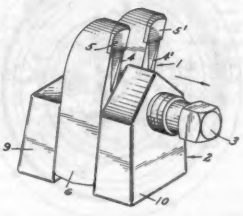
This invention is for a tunnel-boring machine which can be used for boring circular tunnels through rock. The machine comprises a rotary cutterhead, a cutterhead support, a main beam, and a gripper. On the front of the cutterhead there are mounted cutters which fracture the rock. The cutterhead support provides journal mounting for the cutterhead, and is centrally connected to the forward end of the main beam by ball and socket joint means. The ball and socket joint permits angular movement in all directions, viz., X–Y–Z axis, between the cutterhead support and the main beam. The main beam extends rearwardly and is connected by slide way means to the gripper, which permits the main beam to move in a longitudinal direction. The gripper which is a force reaction member of the machine, bridges across the tunnel, providing a rear pivoting support means about the X and Y axis for the main beam, and rigidly fixes the location of the pivot axis at the approximate center of the tunnel.

3,598,446
PAVEMENT SURFACING MACHINE WITH VACUUM WATER RECOVERY SYSTEM
Cecil W. Hatcher, West Covina, Calif., assignor to Concut, Inc., Toledo, Ohio
Filed June 11, 1969, Ser. No. 832,120
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 1 Claim



A pavement surfacing machine having a vacuum system for recovering the water used to cool and to lay the dust produced by the rotary surfacing unit of the machine, which unit comprises transversely spaced circular saws for cutting grooves in the pavement. Cuttings vacuumed up with the water are separated therefrom and the water is then reused. This minimizes the amount of water which must be transported to the job. The vacuum assembly includes a pair of vacuum head means which are disposed parallel to and one on either side of the saws. A shroud having a pavement engaging skirt surrounds the vacuum head means. The entire vacuum assembly is suspended from the machine by flexible means whereby the vacuum assembly may float relative to the saws.

3,598,447
CUTTER BITS AND BLOCKS FOR MINING MACHINES
Arnold B. Bower, Jr., St. Clair Shores, Mich., assignor to General Electric Company
Filed June 30, 1969, Ser. No. 837,684
Int. Cl. E21c *35/18*
U.S. Cl. 299—91 5 Claims



A cutter bit for a mining machine, the shank of which is in the shape of an inverted U, is adapted for mounting upon a

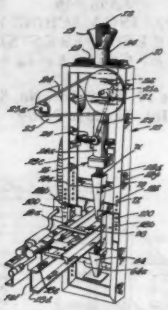
block having a complementary-shaped recess in its midportion defining a bit-receiving zone to receive and releasably hold the cutter bit. The cutter bit may have a single head containing a single wider-than-normal hard cutting tip, or it may contain two or more heads, each containing cutting tips mounted transverse to the direction of cutting.

3,598,448

METHOD AND APPARATUS FOR MANUFACTURE OF SIDE BROOMS

Donald G. Kirk, Elgin, Ill., assignor to Elgin Sweeper Company, Elgin, Ill.

Filed July 7, 1969, Ser. No. 839,287
Int. Cl. A46d *1/08*
U.S. Cl. 300—21 **14 Claims**



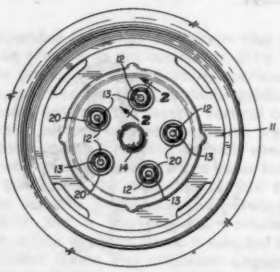
Groups of wires used in side brooms for streetsweepers and similar apparatus are manufactured by apparatus comprising a wire sorter that vibrates to position a specified number of wire broom strands in vertical and lateral position for bending and forming. A transversely moving hydraulic cylinder actuated ram means bends the group of wire through a forming die generally at their midpoint into a hairpinlike configuration. The method of forming the bristle groups and filling wire broom segments includes the steps of counting a predetermined number of straight wire broom strands, orienting these strands in a predetermined relation to one another, holding the predetermined number of oriented strands at an upper and lower position adjacent a forming means, forcing the wire strands through a forming die by means of a ram that moves transverse to the central axis of the group of strands and removing the bent group of wire strands from the forming die and inserting them into a wire broom segment.

3,598,449

TIRE TRUEING MEANS

Henry Replin, 110 S. Dexter St., Denver, Colo.

Filed Nov. 13, 1969, Ser. No. 876,538
Int. Cl. B60b *13/00*
U.S. Cl. 301—5 B **6 Claims**



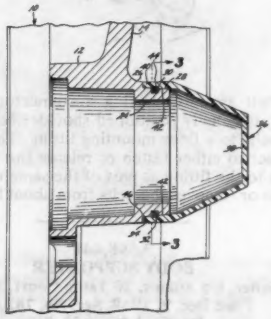
Motor vehicle tire trueing means for automatically correcting imbalance in a tire on a wheel fastened to the vehicle axle by a plurality of lugs and nuts, comprising a series of annular weights, one mounted on each lug nut, and resilient means between each annular weight and the nut on which it is mounted. The trueing means may be an annular weight in the form of a steel ring having a central opening and a groove in the surface defining the opening, and a resilient O-ring in the groove for engaging the nut, or it may be a heavy metal ring mounted on a resilient sleeve which engages the nut.

3,598,450

VEHICLE WHEEL AND WHEEL CAP ASSEMBLY

Raymond Clarence Brown, Tarzana; Phillip Cravits, Burbank, and Charles Pelly, Los Angeles, all of, Calif., assignors to Superior Industries, Inc., Van Nuys, Calif.

Filed Aug. 28, 1969, Ser. No. 853,651
Int. Cl. B60b *7/06*
U.S. Cl. 301—108 R **3 Claims**



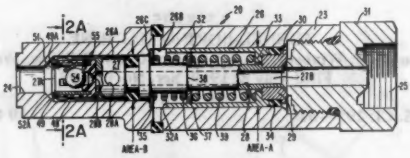
A vehicle wheel and wheel cap assembly in which the wheel cap constitutes an aesthetically attractive axial extension of the central hub of the wheel, the external surface of the cap forming a faired continuation of the adjacent surface of the wheel hub. The wheel and cap are releasably secured together by a resilient annular member carried within confronting grooves formed in faying surfaces of the wheel and cap.

3,598,451

DUAL RATIO PROPORTIONING VALVE

Roger E. Doerfler, Baltimore, Md., assignor to Hydrasearch Co., Inc., Annapolis, Md.

Filed May 6, 1969, Ser. No. 822,170
Int. Cl. B60t *8/26, 11/34*
U.S. Cl. 303—6 C **7 Claims**



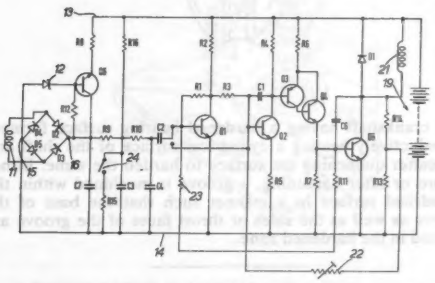
This patent discloses a duel ratio proportioning valve for proportioning fluid hydraulic pressure to one set of brakes of an automotive type vehicle having a hybrid brake system. As disclosed, the valve includes a valve body having a hydraulic fluid inlet and a hydraulic fluid outlet which is communicated by a bore. Mounted in the bore is a spool which is operable to seal the outlet from the inlet upon a first predetermined inlet pressure being reached. The valve includes means to proportion, after the first inlet pressure is reached, the rate of pressure increase at the outlet relative to the pressure increase at the inlet until a second hydraulic inlet pressure is

reached. The valve also includes means for proportioning thereafter further pressure increases at the outlet relative to the inlet at a different rate than the first-mentioned proportioning means.

3,598,452
MEANS FOR CONTROLLING DECELERATION OF A WHEEL

Stanley Clifford, Coventry, and Leonard Ramsay Hiscox, Birmingham, both of, England, assignors to Girling Limited, Birmingham, England

Filed May 8, 1968, Ser. No. 727,469
Claims priority, application Great Britain, May 23, 1967, Oct. 12, 1967, Feb. 8, 1968, 23883/67;46582/67;6223/68
Int. Cl. B60t *7/02*
U.S. Cl. 303—21 CG **5 Claims**

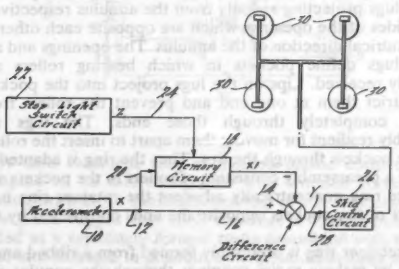


The acceleration or deceleration of a wheel on a rail vehicle is controlled by using the wheel to drive a generator which produces an electrical signal, the magnitude of which depends on the acceleration or deceleration of the wheel. This signal is applied to a DC control circuit which includes means operable to release the brakes if deceleration is being controlled, or to prevent transmission of driving power to the wheel if acceleration is being controlled. The control circuit includes a DC source charged by the generator and providing power to the control circuit, and the arrangement also includes a delay network for maintaining the circuit in a condition to release the breaks or prevent transmission of power in the event that the wheels should lock before the brakes are released or slip before the power is released.

3,598,453
GRADE-COMPENSATED ACCELEROMETER IN AN ANTISKID SYSTEM

Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 7, 1969, Ser. No. 797,484
Int. Cl. B60t *8/14*
U.S. Cl. 303—21 **5 Claims**

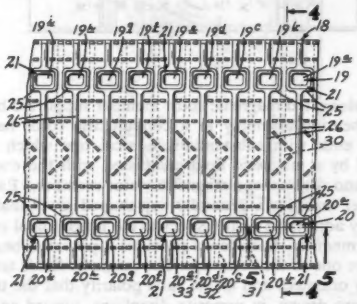


An antiskid system in which an output signal X from a linear accelerometer is fed to a memory circuit. The output XI from the memory circuit will follow the input in the absence of a brake application signal Z. Upon occurrences of signal Z the memory circuit will hold the magnitude of signal XI at the magnitude of signal X before braking until signal Z is removed. Signals XI and X are applied to a difference circuit which produces an output signal Y which is X—XI. Signal Y controls a skid control circuit. In this manner accelerometer errors in output as a result of grade variations are minimized.

3,598,454
VEHICLE DRIVE TRACK STIFFENER

William R. Richards, Roseau, Minn., assignor to Texotron Inc., Providence, R.I.

Filed May 26, 1969, Ser. No. 827,839
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 R **6 Claims**

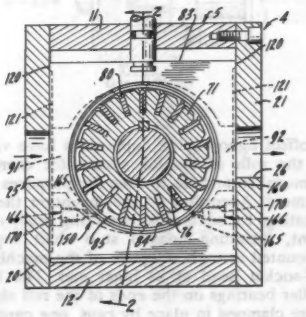


An endless molded rubber drive track or belt is disclosed having two rows of longitudinally spaced openings for engagement with the teeth of a pair of drive sprocket wheels. A plurality of stiffeners formed from unidirectional fiber glass are carried within the belt between the inner and outer surfaces thereof. Each stiffener extends substantially the full transverse width of the belt between adjacent openings to impart transverse rigidity to the belt.

3,598,455
HYDROSTATIC BEARING SYSTEM

Schmitz, Albert A., 5217 Durand Ave., Racine, Wis.

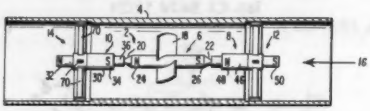
Filed June 27, 1969, Ser. No. 837,278
Int. Cl. F16c *35/00*
U.S. Cl. 308—9 **12 Claims**



A hydrostatic balancing and lubrication system for birotational pumps and motors which utilizes check valves in the passages supplying hydrostatic bearing ares with metered

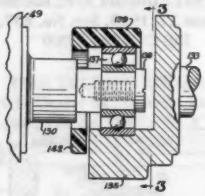
amounts of pressurized fluid. The check valves prevent the backflow of fluid from the bearing areas to that one of alternate sources of fluid having the lower pressure.

3,598,456
MAGNETICALLY SUPPORTED ROTOR IN A CONDUIT
Robert G. Love, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Division of Ser. No. 782,800, Dec. 11, 1968, Pat. No. 3,512,851.
Filed Jan. 23, 1970, Ser. No. 5,211
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **4 Claims**



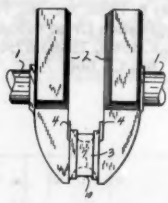
An elongated magnetic rotor member supported by a magnetic bearing assembly in a conduit, the rotor having opposite ends with substantially conical tips which are supported by a magnetic field associated with the ends of the rotor and with spaced magnetic stator members. Each stator member includes a generally cup-shaped jewel that may be radially adjustable with respect to the longitudinal axis of the stator member. Each jewel provides a potential bearing surface for one of the rotor tips. The magnetic fields are longitudinally oriented, and are of such polarity that the tips of the rotor are drawn, in opposite directions, toward an adjacent jewel. The cup shape of the jewels provides lateral support for the rotor tip and aids in the centering thereof.

3,598,457
ROLL MOUNTING
Arthur W. Sejeck, Kirtland, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Division of Ser. No. 568,838, July 29, 1966, Pat. No. 3,521,559.
Filed May 18, 1970, Ser. No. 38,041
Int. Cl. F16c *13/00*
U.S. Cl. 308—22 **8 Claims**



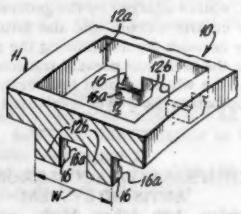
Rotary offset lighographic duplicators have various rolls, especially the rolls of the ink system for example, which require removal from time to time for purposes of cleaning or replacement. According to the invention there are provided mountings for such rolls permitting ready removal and replacement, including coaxial stub shaft supports, one suitably mounted at each sideplate of the machine and having a half-socket head at its inner end. The half sockets receive roller bearings on the ends of the roll shaft, and the bearings are clamped in place by caps, one captive on each end of the roll shaft, and by connecting screws fastening each cap to its respective half socket. Means are provided for adjusting the stub shafts in a transaxial direction so as to set the proper degree of contact between the removable roll and its adjacent roll to accommodate slight variations in roll diameter, and to adjust to exact parallelism.

3,598,458
A CRANKSHAFT HAVING A HARDENED BEARING SURFACE
Marvin Evans, 8550 N. Fielding Road, Bayside, Wis.
Filed Oct. 28, 1968, Ser. No. 771,007
Int. Cl. F16c *3/06, 9/04*
U.S. Cl. 308—167 **3 Claims**



A crankshaft having a hardened bearing surface formed, by inductively heating a cylindrical surface of the shaft and thereafter quenching the surface to harden the same. Either before or after hardening, a groove is machined within the cylindrical surface in a manner such that the base of the groove as well as the sides or thrust faces of the groove are located in the hardened zone.

3,598,459
RETAINER RING FOR ROLLER BEARING
James L. Vannest, New Britain, Conn., assignor to Textron Inc., Providence, R.I.
Filed Feb. 12, 1969, Ser. No. 798,618
Int. Cl. F16c *33/46*
U.S. Cl. 308—217 **6 Claims**



A retainer ring for bearing rollers is a cylindrical annulus with rectangular openings radially therethrough and pairs of spaced lugs projecting radially from the annulus respectively at the sides of the openings which are opposite each other in the cylindrical direction of the annulus. The openings and adjacent lugs define pockets in which bearing rollers are rotatably received. Lips on the lugs project into the pockets to constrict them at one end and prevent the rollers from passing completely through those ends. The lugs are preferably resilient for moving them apart to insert the rollers into the pockets through the lips. Thus the ring is adapted to provide a preassembly consisting of rollers in the pockets and one race ring concentrically adjacent the retainer ring over the ends of the pockets opposite the ends constricted by the lips.

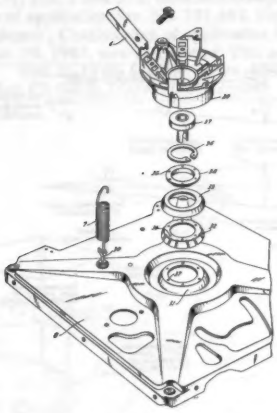
The retainer ring is preferably formed from a ribbed annulus by making radial openings through the annulus and ribs and by enlarging the width of the openings to a depth less than the projecting limits of the ribs. The ribs are thus formed into lugs with lips projecting from their end portions.

3,598,460

BEARING WITH CONTROLLED FRICTION

Richard Lee Conrath, Herrin, and Clarence Melvin Overturf, Carterville, both of, Ill., assignors to Fedders Corporation, Edison, N.J.

Filed Feb. 19, 1969, Ser. No. 800,493
Int. Cl. F16c 27/60; D06f 29/00; B05c 11/00
U.S. Cl. 308—238 7 Claims



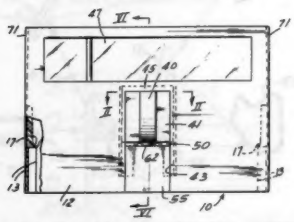
A bearing surface is provided with a lining composed of polytetrafluoroethylene and a second lubricant material and the opposite bearing surface is provided with a roughened surface of controlled degree. On relative motion of the two surfaces, the polytetrafluoroethylene is transferred, at a controlled rate, to the roughened bearing surface to provide lubrication with a controlled degree of friction.

3,598,461

CARD CATALOGUE TRAY OF MOLDED PLASTIC CONSTRUCTION

Lorraine Jensen Grau, 5819 N. Sacramento Ave., Chicago, Ill., and Neil S. Collins, West 194 Mayflower Drive, Niles, Ill.

Continuation-in-part of application Ser. No. 662,656, Aug. 23, 1967, now abandoned. This application Jan. 29, 1969, Ser. No. 794,865
Int. Cl. A47b 63/00
U.S. Cl. 312—189 25 Claims



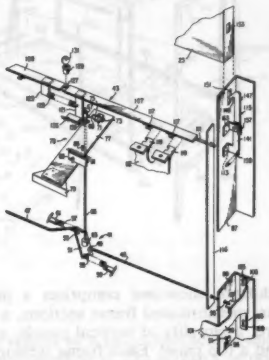
A card catalogue tray of molded plastic construction is adapted to be interchangeable with wooden trays for the same purpose. To facilitate molding of the tray proper as a one piece rugged thin shell structure a drawer pull is provided as a separately formed piece assembled with the front wall and retained in position by a metal slide track mounted functionally and reinforcingly in a groove in the bottom of the tray and latched in position therein. A card-retaining rod has a front end manipulating head member detachably retained at the front of the tray in association with the drawer pull. All of the assembled elements are in quick digital assembly and release relation requiring no tools. Outer sidewall panels of the tray are resiliently flexible in the lower portions to avoid binding in a cabinet.

3,598,462

LOCKING MECHANISM FOR A MECHANIZED FILING CABINET

Roy E. Kanitz, Belpre, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 10, 1970, Ser. No. 27,294
Int. Cl. F05b 65/46; E05b 65/44; A97b 97/00
U.S. Cl. 312—219 10 Claims



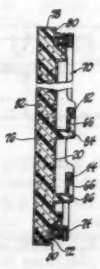
A locking mechanism for use in a mechanized filing cabinet having a position adjustable posting board and a vertically sliding door for closing an access opening. The posting board is moved to a predetermined position and a release handle is moved inwardly to cause shoot bolts to move outwardly and lock the posting board at the predetermined position. The vertically sliding door is moved downwardly to close the access opening in the filing cabinet and a locking key is rotated to move lock bolts outwardly. Movement of the lock bolts locks the release handle and moves latches into apertures in the sliding door thereby locking the sliding door in its lower or closed position.

3,598,463

SHELF WITH INTEGRAL FRONT

Keith K. Kesling, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 684,049, Nov. 17, 1967, Pat. No. 3,467,741.
Filed Apr. 3, 1969, Ser. No. 813,155
Int. Cl. A47f 3/04, 5/00; E06b 5/00; F25d 11/00
U.S. Cl. 312—214 1 Claim

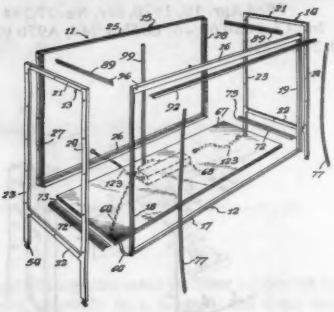


In the preferred form, the inner sheet plastic door panel has formed in it an integral shelf and an integral shelf front in which the plastic sheet envelops a reinforcing bar above and parallel to the shelf.

3,598,464
KNOCKDOWN SHOWCASE

William M. Moroziuk, River Grove, Ill., assignor to Garcy Corporation

Filed July 10, 1968, Ser. No. 743,663
Int. Cl. A47b 47/00, 57/08
U.S. Cl. 312—257 9 Claims

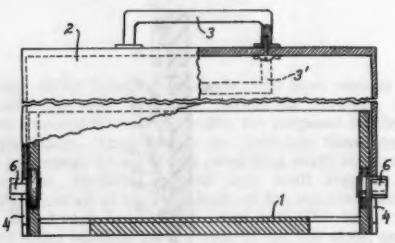


A knockdown showcase comprises a plurality of rigid, rectangular, prefabricated frame sections, a bottom panel, a light fixture, a plurality of vertical panels, a rear closure assembly, and a top panel. Each frame section is fabricated by welding a pair of vertical uprights to top and bottom stretchers. The light fixture is secured to the front frame section, and the wiring for the fixture is concealed in a duct formed by either of the uprights of the front frame section. The front, back and two end frame sections are secured together, and the bottom panel is seated on panel retaining members extending inwardly from the bottom stretchers of each frame section. The rear closure assembly may be mounted any time after the bottom panel is positioned. The vertical end panels are slid into place adjacent the respective end frame sections, and the front panel is secured in place from the front of the showcase by a pair of bowed resilient retaining strips. The top panel is then seated on top of the frame sections and secured by a trim strip.

3,598,465
BOXLIKE CONTAINER WITH REMOVABLE COVER

Paul Schmid, Im Ettingerhof 5, Basel, 4000, Switzerland, and Paul Halter, Therwilerstr. 43, 4103 Bottmingen, Switzerland

Filed Jan. 27, 1969, Ser. No. 794,086
Int. Cl. A47b 81/00
U.S. Cl. 312—284 5 Claims

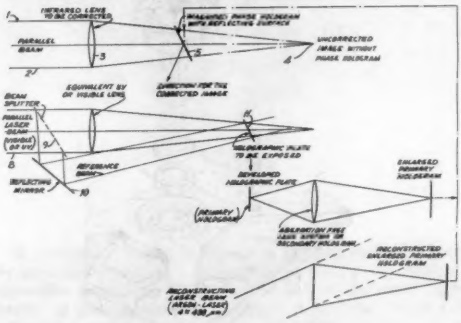


A boxlike container with a removable cover, each end wall of the box carrying a rotatable lock to connect the container to the cover or disconnect it therefrom, depending on the angular position into which the lock has been rotated.

3,598,466
HOLOGRAPHIC CORRECTION PROCESS FOR OPTICAL SYSTEM ABERRATIONS

Wolfgang Friedl, Neckargemund, Germany, assignor to Eltro GmbH & Co., Heidelberg, Germany

Filed May 11, 1970, Ser. No. 36,096
Claims priority, application Germany, May 10, 1969, P 19 23 932.8
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 10 Claims

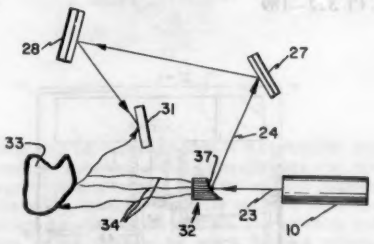


A hologram is produced by a corrective optical system operative in the visible radiation band, and the hologram is incorporated in an infrared optical image-reproducing system to correct aberrations of the infrared optical system. The visible radiation optical system is constructed to have aberrations identical to those of the infrared optical image system and the hologram is combined with the infrared optical system after magnification of the hologram on a linear scale of reproduction by the ratio of the IR wavelength to the wavelength in the visible band.

3,598,467
FIBER OPTIC DIFFUSER FOR HOLOGRAPHY

Durk Jon Pearson, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 28, 1969, Ser. No. 811,432
Int. Cl. G02b 27/00, 5/02, 5/16
U.S. Cl. 350—3.5 2 Claims



A holographic apparatus capable of utilizing a pulsed laser developing an incompletely coherent light beam for recording holograms. The apparatus makes use of a bundle of transparent fibers used as a new optical element. This fiber bundle serves both the purpose of directing the light toward the object to be recorded and of scrambling or diffusing the light from the source. Essentially each fiber of the fiber bundle creates a cone of light which illuminates substantially the entire object. As a result, at the recording material for the hologram there is at least a component or portion of the scene beam capable of interfering with a component of the reference beam. The fiber bundle also makes it possible to direct the light beam around obstacles or close to

an object for holograhic microscopy or for taking holograms of an object in a hostile environment such as a rocket engine generating a great amount of heat. The holograms may be made both of objects in reflection and in transmission.

3,598,468

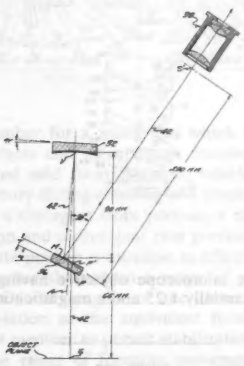
OPTICAL SYSTEM WITH TILTED CONCAVE MIRROR AND ASTIGMATISM COMPENSATOR

Donald M. Perry, Rte. 2 Box 573, Gresham, Oreg.

Continuation of application Ser. No. 781,662, Oct. 3, 1968, now abandoned , Continuation of application Ser. No. 274,149, Apr. 19, 1963, now abandoned. This application Feb. 2, 1970, Ser. No. 7,394

Int. Cl. G02b *21/04, 17/00, 23/06*

U.S. Cl. 350—55 8 Claims



An optical system for a microscope includes a spherical mirror tilted a few degrees relative to the optical axis, and a plano plate having a transparent refractive portion in the path to the mirror and a reflective surface in the path from the mirror, with the plate tilted so that its refractive portion corrects astigmatism which results from tilting of the mirror. An optical system for a telescope is similar except that a right angle prism is used in place of the plano plate.

3,598,469

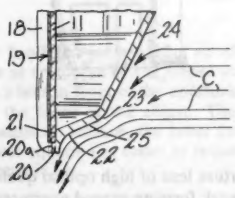
MIRROR FRAME

William J. Landen, New Haven, Conn., assignor to Landen Corporation, Cheshire, Conn.

Filed Jan. 7, 1970, Ser. No. 1,127

Int. Cl. G02b *5/08*

U.S. Cl. 350—63 12 Claims



This disclosure relates to a frame for automobile rearview mirrors which is constructed and arranged for the removal of moisture from the face of a mirror mounted in the frame. The frame is so constructed that when air impinges thereon, a region of low pressure is established along one or more edges thereof. Moisture on the face of the mirror will then move across the face of the mirror toward the region of low pressure and will be removed from the face of the mirror.

3,598,470

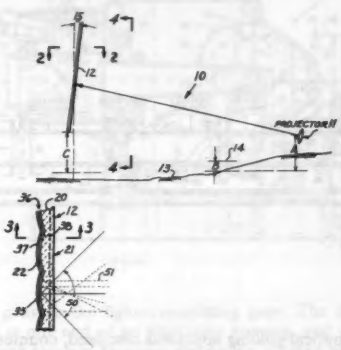
PROJECTION SCREEN AND SYSTEM

Richard Harold Vetter, Pacific Palisades, Calif., assignor to Prismalite, Inc., San Francisco, Calif.

Continuation-in-part of application Ser. No. 779,722, Nov. 29, 1968, now abandoned. This application Nov. 5, 1969, Ser. No. 874,311

Int. Cl. G03b *21/60*

U.S. Cl. 350—117 39 Claims



This invention relates to a projection screen and to a projection system incorporating it. The screen comprises a plate of transparent material having a face toward the viewer formed of generally horizontal optical wedges, and a face away from the viewer formed of generally vertical curved surfaces which are axial portions of circular cylinders. The circular surfaces fan out a beam in a controlled pattern, and the wedges refract the beam away from the normal to the screen. Preferably the front face is frosted to a diffusive but primarily transmissive condition. In the preferred embodiment for front projection, the curved surfaces are concave toward the front face and are coated with a reflective material, and the front faces of the wedges are lenticularly curved.

3,598,471

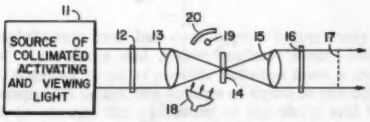
OPTICAL CONTRAST ENHANCEMENT SYSTEM

William J. Baldwin, West Roxbury, Mass., and Jurgen R. Meyer-Arendt, Forest Grove, Oreg., assignors to Corning Glass Works, Corning, NY

Filed Nov. 22, 1968, Ser. No. 778,219

Int. Cl. G02b *27/38*

U.S. Cl. 350—162 7 Claims

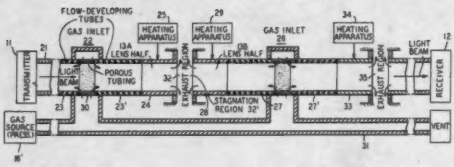


An optical system for enhancing the contrast of optical images. A sheet of photochromic material is disposed in the Fraunhofer diffraction or first Fourier transform plane of the optical system. Among the wavelengths of light transilluminating the object or transparency is a band which darkens the photochromic material especially at the center of the Fourier series display which contains contrast information (the zeroth order of the Fourier series display). This zeroth order term is attenuated to a much greater degree than the higher order terms which contain the information describing the object or transparency, thus producing an enhanced image.

3,598,472
COUNTERFLOW GAS LENSES

Peter Kaiser, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 759,069, Sept. 11, 1968, now abandoned. This application Dec. 5, 1969, Ser. No. 882,416
Int. Cl. G02b 3/12
U.S. Cl. 350—179 10 Claims

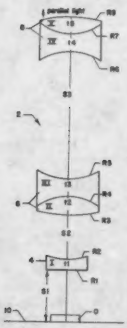


In the optical guiding apparatus disclosed, counterflow gas lenses are provided with improved focusing properties by providing radial exhaust of the hot gases before they cool significantly. Substantial radial symmetry of the exhaust provides stable stagnation regions at the junctures of the counter flows. A relatively long conduit section is employed to develop laminar flow of the inlet gas and to permit relatively high gas velocities that make gravity aberrations negligible. To further reduce gravity aberrations, the exhaust ends of the lens halves may be lifted with respect to the inlet ends of the lens halves.

3,598,473
THREE MEMBER ACHROMATIC MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1970, Ser. No. 20,732
Int. Cl. G02b 9/12, 21/02
U.S. Cl. 350—176 2 Claims

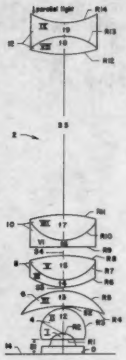


A three-member microscope objective having a numerical aperture of substantially 0.07 and a magnification of substantially 2.5 ×.

3,598,474
OIL-IMMERSION-TYPE MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1970, Ser. No. 20,734
Int. Cl. G02b 9/60, 21/02
U.S. Cl. 350—176 2 Claims

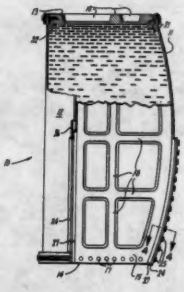


A five-member microscope objective having a numerical aperture of substantially 1.25 and a magnification of substantially 100 ×.

3,598,475
LARGE APERTURE LIQUID-FILLED LENS FOR PRECISION ARTWORK CAMERA

Robert E. Lewis, Palo Alto; Melvin D. Wright, San Jose, and Philip E. Chandler, Redwood City, all of, Calif., assignors to Teledyne, Inc., Hawthorne, Calif.

Filed Sept. 16, 1968, Ser. No. 762,279
Int. Cl. G02b 3/12; G03b 27/00
U.S. Cl. 350—179 13 Claims

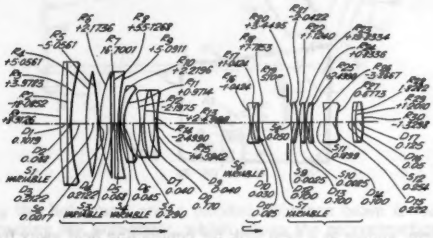


A large aperture lens of high optical quality consisting of a hollow framework forming spaced apertures bounded by optical grade clear, bendable, flat windows bent into simply curved shapes and mounted in spaced relation on the framework to form a vessel for containing a liquid having a suitable index of refraction. In one form of the invention the windows are curved on cylindrical surfaces having axes arranged at right angles to each other and have the same curvature. A window-mounting arrangement is also disclosed which avoids undesirable stress development. A precision artwork camera using a lens of the above type as a condenser is also disclosed.

3,598,476
ZOOM LENS FRONT MEMBER ADJUSTABLE FOR FOCUSING

Peter Arnold Merigold, Prestatyn, Wales, assignor to The Rank Organization Limited

Continuation-in-part of application Ser. No. 567,207, July 22, 1966, now abandoned. This application Apr. 16, 1969, Ser. No. 816,630
Int. Cl. G02b *15/16, 15/18*
U.S. Cl. 350—186 8 Claims

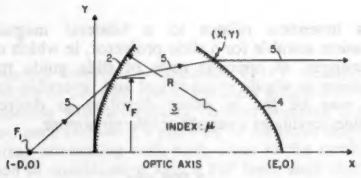


A front member for a zoom lens which is corrected for aberration defects and incorporates members movable for zooming behind said front member, which front member remains stationary during zooming and consists of three portions, namely a divergent front portion, a convergent intermediate portion and a divergent rear portion, of which only the intermediate portion is movable to effect focusing of the complete objective throughout a range of object distances, the equivalent focal lengths of the three portions being selected in relation to the equivalent focal length of the complete front member to permit stabilization of aberrations throughout the range of focusing movement of the intermediate portion.

3,598,477
LENS HAVING ONE SPHERIC AND ONE ASPHERIC SURFACE

Robert E. Levin, Hamilton, Mass., assignor to Sylvania Electric Products Inc.

Filed June 9, 1969, Ser. No. 831,332
Int. Cl. G02b *13/18*
U.S. Cl. 350—189 2 Claims



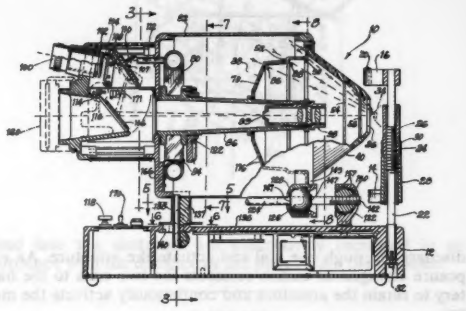
An automobile headlight lamp having an elliptical reflector, a light source at one focus of the ellipse and an aperture at the other, with a lens in front of the aperture, the lens having one focus at the focus of the ellipse. The lens has one spheric and one aspheric surface, the latter conforming to a stated mathematical equation in order to reduce aberrations, including the chromatic.

3,598,478
APPARATUS FOR DETERMINING CORNEA CONTOUR

Malcolm G. Townsley, Park Ridge, Ill., assignor to The Plastic Contact Lens Company, Chicago, Ill.

Filed Nov. 26, 1968, Ser. No. 778,965
Int. Cl. A61b *3/14, 3/10*
U.S. Cl. 351—6 8 Claims

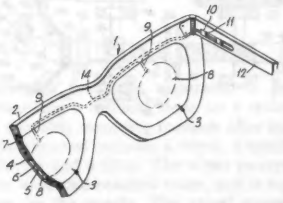
An apparatus for determining the contour of the human cornea comprising a substantially opaque target having a plurality of light-transmitting gaps through which light beams can be projected onto the eye of a patient. The pattern of light beams reflected in the eye can then be photographed with the particular configuration providing a basis for determining mathematically the contour of the eye. The target structure comprises a pair of hollow plastic shells provided with an opaque coating. The coating is removed in selected areas to provide the light-transmitting gaps. The shells are mounted at one end of an adjustable housing, and a camera and through-the-lens focusing means are located at the opposite end of the housing. The adjusting means comprise double joint ball and socket means which permit the operator to make finite adjustments for accurate alignment while viewing the eye.



3,598,479
VARIABLE FOCUS LIQUID LENSES

Basil Martin Wright, Croxley Green, Rickmansworth, England, assignor to National Research Development Corporation, London, England

Filed Mar. 10, 1969, Ser. No. 805,717
Claims priority, application Great Britain, Mar. 11, 1968, 11862/68
Int. Cl. G02c *7/08;* G02b *3/12*
U.S. Cl. 351—159 1 Claim



An ophthalmic lens has components respectively in the form of a meniscus and a thin resilient sheet, which are secured together so as to provide between them a cell filled with transparent liquid, the volume of liquid in the cell being variable to change the curvature of the sheet and thereby provide a continuous variation in the focus of the lens.

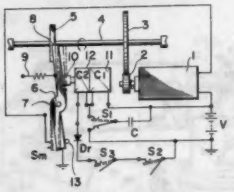
3,598,480
ELECTROMAGNETIC RELEASE DEVICE FOR A MOTION-PICTURE CAMERA

Isamu Kubota, Izumisano-shi; Yoshihisa Hayashi, Sakai-shi, and Takeshi Ataka, Sumiyoshi-ku, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 16, 1969, Ser. No. 858,301
Claims priority, application Japan, Sept. 27, 1968, 43/69453
Int. Cl. G03b *17/46*
U.S. Cl. 352—169 5 Claims

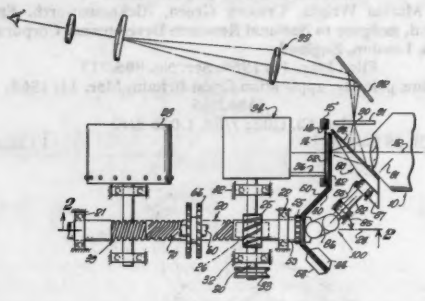
A battery-energized electromagnetic release for selecting continuous or single frame advancement of the film com-

prises two electromagnetic coils and a charged condenser for actuating and holding an armature switch to release a rotary stop mechanism and activate the film drive motor. The condenser is switched from a connection with the battery to



discharge through one coil and actuate the armature. An exposure changeover switch connects the two coils to the battery to retain the armature and continuously activate the motor.

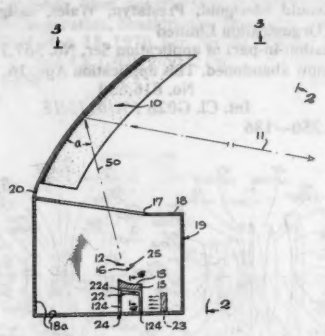
3,598,481
SHUTTER DRIVE MECHANISM
George A. Mitchell, 687 Prospect Crescent, Pasadena, Calif.
Filed Mar. 27, 1970, Ser. No. 23,298
Int. Cl. G03b *9/8*
U.S. Cl. 352—206 **2 Claims**



Variable shutter mechanism for a motion picture camera has the main shutter blade mounted on the forward end of the main shutter shaft and driven in fixed phase relation to the intermittent mechanism, and the variable shutter blade journaled coaxially to the rear of the main blade, leaving the forward end of the main shaft available for driving connection to other apparatus. A reflex shutter may be mounted on an oblique axis forward of the main shutter mechanism, the reflex shutter shaft being coupled directly to the main shaft, preferably via a constant speed universal joint.

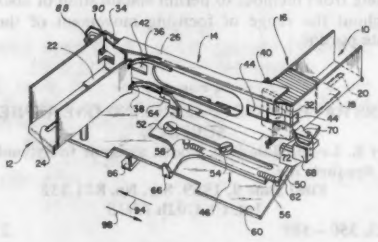
3,598,482
OPTICAL PROJECTION SYSTEM
Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.
Filed Mar. 6, 1967, Ser. No. 620,864
Int. Cl. G03b *21/28*
U.S. Cl. 353—98 **26 Claims**

An optical projector having a mirror which reflects light from a light source into a projection system, and which has an optical object formed on the reflective face of the mirror at a location to be projected as an image onto a screen. The mirror is preferably constructed to function as a light condenser, for directing light primarily into the projection



system, and/or as a heat sink for conducting heat away from the optical object.

3,598,483
BILATERAL MAGAZINE FEED MEANS FOR PROJECTOR APPARATUS
Floyd M. Galbraith, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 29, 1967, Ser. No. 686,467
Int. Cl. G03b *23/14, 23/02*
U.S. Cl. 353—114 **8 Claims**

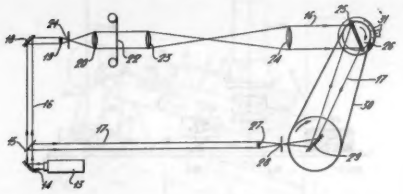


This invention relates to a bilateral magazine feed mechanism suitable for a slide projector, in which magazines are arranged at opposite ends of slide guide track. The mechanism is wholly symmetrical and reversible so that the slides may be fed in either direction as desired, either magazine serving as a supply or takeup hopper.

3,598,484
HOLOGRAPHIC METHOD
John David Redman, Newbury, and William Philip Wolton, Basingstoke, both of, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Oct. 25, 1968, Ser. No. 770,664
Claims priority, application Great Britain, Oct. 26, 1967, 48,842/67
Int. Cl. G03b *27/42*
U.S. Cl. 355—2 **17 Claims**

A holographic method of producing a three-dimensional reconstruction of a scene comprises producing a plurality of representations, e.g. positive photographic transparencies, of the scene at a corresponding plurality of viewing angles relative to the scene, e.g. by moving a camera in an arc about a point in the scene, making holograms from the representations on a common photosensitive plate, each hologram being made using a nondiffused object beam directed onto the plate at an angle corresponding to the viewing angle of the representation from which is made and a reference beam directed at a constant angle onto the plate for all the holo-

grams, and forming a reconstruction of the holograms using a reference beam directed at the same constant angle onto the plate. Preferably a divergent reference beam is used in making the holograms and a parallel reference beam is reconstructing the holograms, which allows the reconstruction to be viewed directly, without the need for a converging viewing lens.

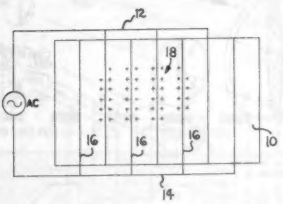


3,598,485

ELECTRODE CONFIGURATION FOR AC ELECTROPHOTOGRAPHY

John D. Grier, and Maclin S. Hall, both of Okemos, Mich., assignors to Owens-Illinois, Inc.

Filed Apr. 1, 1969, Ser. No. 812,275
Int. Cl. G03g *15/00, 15/02*
U.S. Cl. 355—3 **2 Claims**



A persistent internal polarization (PIP) electrophotography printing or copying system uniquely adapted to be used in combination with alternating current wherein a pair of electrodes, each including a plurality of elements disposed in spaced array alternating with each other in the same plane, are utilized in combination with a PIP layer such that an alternating current electric field may be simultaneously applied to the PIP layer while permitting light radiation to reach the PIP layer. In the specific practice, the pair of electrodes are positioned on top of or embedded in the surfaces of the PIP layer which is to be toned; that is, the top surface.

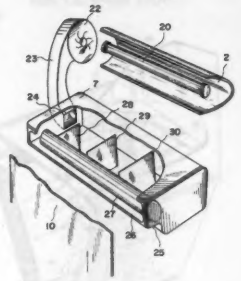
3,598,486

DRYING DEVICE FOR ELECTRO PHOTOGRAPHIC COPYING MACHINES

Teizo Kushima, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1969, Ser. No. 798,876
Claims priority, application Japan, Feb. 16, 1968, 43/11,379
Int. Cl. G03b *27/54*
U.S. Cl. 355—10 **6 Claims**

Hot air from the light source chamber is forced into a housing having an air inlet and an air outlet in close proximity to the exposed photosensitive paper. A heat radiation source is mounted in the outlet in the path of the air. Guide plates are mounted in the housing in the airstream from the inlet to change the air flow direction approximately 90°. Both the size of the guide plates and the extent to which they extend into the airstream are successively increased in accordance with the distance of the plates from the air inlet.

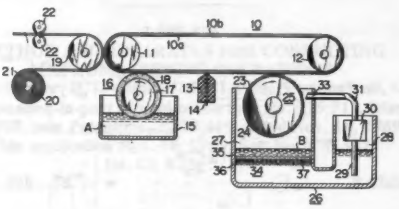


3,598,487

ELECTROSTATIC RECORDING APPARATUS

Mamoru Mizuguchi, Kawasaki-shi; Teruo Kurihara, Yokohama-shi, and Masasumi Yana, Yokohama-shi, all of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 14, 1969, Ser. No. 791,084
Claims priority, application Japan, Jan. 18, 1968, 43/2,606
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **9 Claims**



An electrostatic recording apparatus is provided with means for removing a residual toner on a recording surface carried by a movable recording medium after image transfer. The means for removal includes a wiper, a nozzle, a vessel, a circulating device and a filter. The wiper sweeps the recording surface to wipe said residual toner, and is supplied with a liquid cleaner by the nozzle. The vessel stores therein the liquid cleaner discharged from the nozzle and dispersed with the toner removed from the wiper. The toner dispersed in the liquid cleaner is removed by the filter, and then the liquid cleaner is circulated by the circulator to be discharged again from the nozzle. When the wiper is made of a liquid-absorbing soft material, there is further provided a pressing means for squeezing said wiper material containing the residual toner removed from the recording surface.

3,598,488

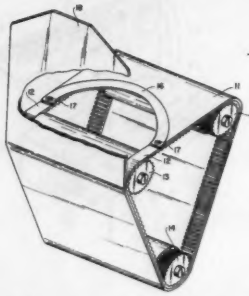
CLEANING WEB

Alphonse B. Di Francesco, Rochester, N.Y., and James D. Shaw, Piney Point, Md., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,889
Int. Cl. A47l *13/40*; G03g *15/00*
U.S. Cl. 355—15 **10 Claims**

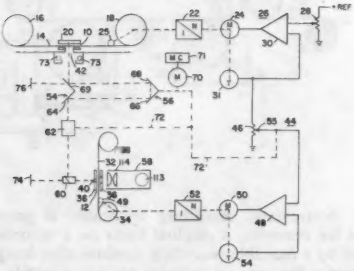
An elongated, flexible cleaning web is attached at one end to spaced, endless timing belts by means of a tow strap having the form of a catenary curve to pull the cleaning web along an endless path to clean a flexible photoconductor.

The catenary curve of the two strap reduces longitudinal wrinkling of the web, particularly as it passes around corners.



Lateral wrinkling is reduced by not attaching the other end of the web.

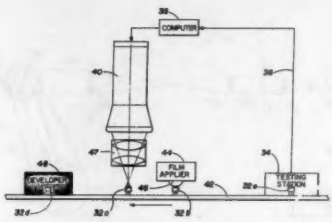
3,598,489
PROJECTION SYSTEM
Doyle W. Thomas, and Clarence E. Ellis, both of Huntsville, Ala., assignors to Spaco, Inc., Huntsville, Ala.
Filed Jan. 2, 1969, Ser. No. 788,378
Int. Cl. G03b *27/70*
U.S. Cl. 355—51 **15 Claims**



A photographic system for projection of images on a continuous flow basis between a medium carrying images and a medium being exposed to them and providing for adjustable magnification or reduction of images and wherein the speed or travel of the viewed and exposed media are precisely determined and synchronized in accordance with the speed of one of them and the ratio of image magnification or reduction.

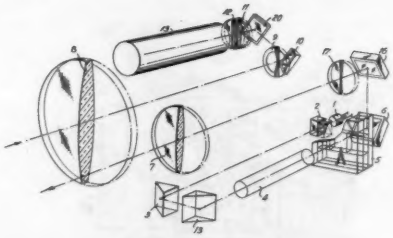
3,598,490
HIGH-SPEED SYMBOLIZATION OF SEMICONDUCTOR ARTICLES
Gerald Anthony Yearsley, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 24, 1968, Ser. No. 770,261
Int. Cl. G03b *27/32*
U.S. Cl. 355—77 **11 Claims**

Tests are conducted on preselected characteristics of semiconductor components. A layer of film is applied to each semiconductor component, the film adapted to exhibit variations in optical transmissivity upon the application of radiant energy. In response to the test results, an image of the desired symbolization is projected upon the layer of film in order to expose the film. Heat or high intensity light is then



applied to the exposed film to develop the film and provide the desired symbolization on the semiconductor component.

3,598,491
LASER TRANSMITTER AND RECEIVER DEVICE
Walther Hess, Dilsberg-Neuhof; Dieter Frohlich, Neckargemund, and Winfried Svenson, Schwetzingen, all of, Germany, assignors to Eltro GmbH & Co., Gesellschaft fur Strahlungstechnik, Heidelberg, Germany
Filed Jan. 21, 1969, Ser. No. 792,866
Claims priority, application Germany, Jan. 19, 1968, E26356
Int. Cl. G01c *3/02*
U.S. Cl. 356—4 **5 Claims**

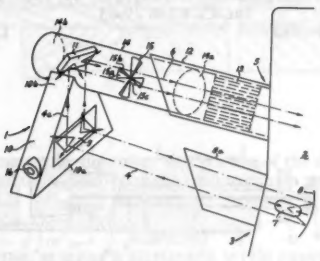


Laser-transmitting-receiving apparatus which includes a transmitter and a receiver. In the transmitter the laser beam path is divided into three parallel sections, the first and second of which lie in a common plane and the second and third of which lie in a common plane. The third section exits from the apparatus. In the first section is a Q-switch prism and a deflector, In the second section is a deflector, a ruby rod and a plane plate resonator. In the third section is a deflector and a telescopic optical arrangement. The receiver provides a beam part including two consecutive and parallel sections. In the first section is a receiving objective and an aperture-providing device as well as a deflecting mirror. In the second part is a deflecting mirror, a lens, an interference filter and a photomultiplier.

3,598,492
OPTICAL CALIBRATING DEVICE INCLUDING LIGHT DIFFUSERS TO SIMULATE A PATH OF BACK-SCATTERED LIGHT
Frank Fruengel, 105 A, Herivigredder, D2 Hamburg 56, Germany
Filed Dec. 22, 1969, Ser. No. 887,303
Claims priority, application Germany, Dec. 20, 1968, G 68 12 334.2-7101
Int. Cl. G01n *21/00*
U.S. Cl. 356—103 **11 Claims**

Cooperating first and second light diffusers are arranged such as to simulate a path of backscattered light between a light impulse transmitter and receiver. The light diffusers

respectively extend at inclined angles relative to each other and to the transmitter and receiver. The first diffuser is operative for diffusely reflecting incident light from the transmitter to the second diffuser and the latter is operative for



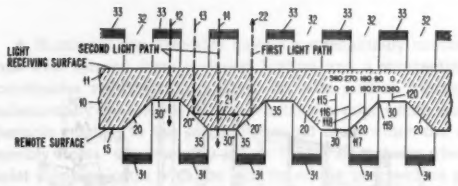
diffusely reflecting incident light from the first diffuser to the receiver. A diaphragm with adjustable apertures between the second diffuser and the receiver varies the amount of light reflected to the receiver to thereby permit simulation of different visual ranges.

3,598,493

OPTICAL GRADUATED RULE OF TRANSPARENT MATERIAL

Gene A. Fisher, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,826
Int. Cl. G02b *17/00*
U.S. Cl. 356—152 **15 Claims**



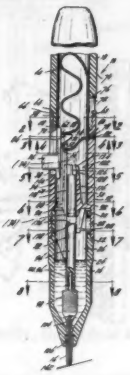
Transparent material having internal reflection properties is used to fabricate a graduated optical rule usable in tachometer or displacement measuring systems. The member has a light-receiving surface through which light is transmitted toward a remote surface in a given direction. Such remote surface has alternating first surface portions respectively having a 45° angle with respect to said given direction and, preferably, second surface portions that are perpendicular to said given direction. The 45° surface portions reflect the light to a first light path, while the second surface portions permit the light to be transmitted therethrough along a second light path. Facing ones of said first or 45° angled portions are utilized to reflect the light through such first light path which intersects the light receiving surface back toward the light source. In another embodiment, light enters the member at 45° through a light receiving surface. A continuous internal surface disposed at 45° with respect to the light-receiving surface reflects light toward the remote surface in such given direction. The remote surface has the first and second surface portions disposed with respect to light traveling in such given direction reflected from the internal surface for alternately reflecting and transmitting through the remote surface toward a detector. Several utilization arrangements are illustrated.

3,598,494

DRAFTING PEN WITH DRIED INK COLLECTOR

Edward Bok, 7348 Lee Hwy., Apt. #201, Falls Church, Va.

Filed Oct. 31, 1969, Ser. No. 875,604
Int. Cl. B43k *1/06*
U.S. Cl. 401—259 **11 Claims**



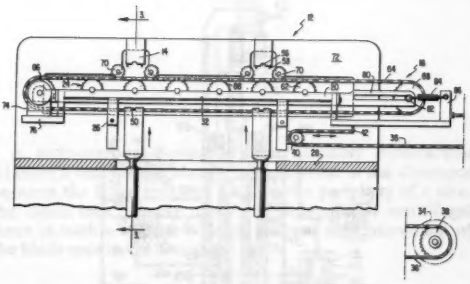
A drafting pen of the type having a barrel enclosing an ink reservoir with an axially aligned vent hole in its top and an ink capillary passage in its bottom and including a valving stem axially reciprocal within said vent hole at the top and having a cleaning wire at its bottom engaging said capillary passage. The invention includes a modification of the valving stem and the vent hole so as to collect dried ink within the vent hole, then displace the ink longitudinally above and away from the vent hole.

3,598,495

METHOD AND APPARATUS FOR CONDUCTING MACROMACHINING OPERATIONS

John A. Cupler, II, 10 Cupler Drive-LaVale, Cumberland, Md.

Continuation-in-part of application Ser. No. 715,711, Mar. 25, 1968, now Patent No. 3,478,419, dated Nov. 18, 1969.
This application Nov. 10, 1969, Ser. No. 875,327
Int. Cl. B23g *3/157*
U.S. Cl. 408—35 **8 Claims**



The disclosure introduces an extension of the noncaptive tool changer principles, previously utilized primarily in connection with micromachining operations, to include larger or macro tools.

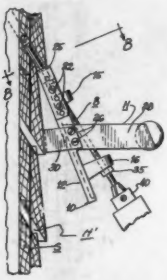
The disclosure is directed to methods and apparatus for automatically interchanging a plurality of noncaptive rotary tools between working and nonworking positions; for imparting continual rotation to both the working and nonworking tools at all times that any one tool is actually working; for effecting tool interchange without disrupting the continual rotational input to any of the tools; and for infeeding and retracting a working tool, relative to its bearing support, under the respective influences of an elongated rotary cam and a wide chain link drive including dynamic biasing means.

3,598,496

JIG FOR DRILLING SIDING

Harley L. Skinner, Bellwood, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed June 25, 1969, Ser. No. 836,492
Int. Cl. B23b *49/00*
U.S. Cl. 408—115 4 Claims



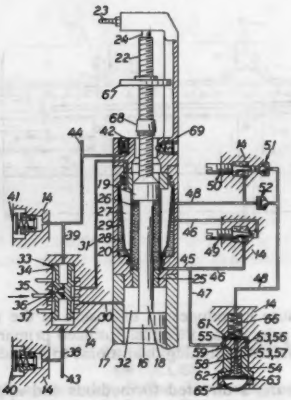
A jig designed to support a bit for drilling vent holes in siding of frame buildings, comprising a base-plate having fixed posts journaling a bit for drilling vent holes at substantially a uniform optimum angle in siding. The tool is also designed to take simple accessory fittings for adapting it to operate on siding of different types and thicknesses.

3,598,497

POWER-OPERATED UNIT FOR DRILLING AND SIMILAR PURPOSES

Bengt Ebbe Harald Nyman, Rockford, Ill., assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 2, 1969, Ser. No. 854,507
Claims priority, application Sweden, Sept. 10, 1968, 12127/68
Int. Cl. B23b *47/24*
U.S. Cl. 408—130 7 Claims



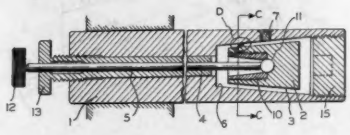
A drilling unit is arranged which has power means for moving the drill axially. When, during rapid feed motion, the drill engages a workpiece, a cutoff valve blocks off a passage for a speed-controlling hydraulic fluid flow. The fluid must now pass a metering valve. This results in a slower working feed.

3,598,498

ADJUSTABLE DEVICE FOR DAMPING VIBRATIONS IN TOOL-HOLDING RODS, IN PARTICULAR BORING BARS, IN MACHINE TOOLS

Hans Kristian Holmen, Trondheim, Norway, assignor to Sintef, Trondheim, Norway

Filed July 24, 1969, Ser. No. 844,375
Claims priority, application Norway, July 29, 1968, 2975/68
Int. Cl. B23b *29/03*
U.S. Cl. 408—143 17 Claims



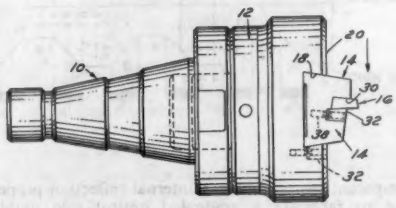
The invention relates to an adjustable device for damping vibrations in tool-holding rods, in particular boring bars in machine tools, comprising a damping mass located in an axial bore in the tool-holding rod and coupled thereto by means of at least one spring element and adapted to be subjected to a damping effect by means of a damping fluid which at least in part fills up the space between the damping mass and the bore, characterized in that the damping mass and the bore have a substantially conical basic shape and that the damping mass is axially adjustable in the bore.

3,598,499

BORING HEAD ASSEMBLY

James A. Dillon, Jr., 24749 Panama, Warren, Mich.

Filed Apr. 9, 1969, Ser. No. 814,582
Int. Cl. B23b *29/03*
U.S. Cl. 408—148 3 Claims



A boring head assembly comprising a head having a radially extending slot, and a removable blade-carrying slide adjustably mounted in the slot. A reference block is also adjustably mounted in the slot having a locating surface adapted to contact and radially locate the slide. A microscrew carried by the block provides a second slide-locating surface.

3,598,500

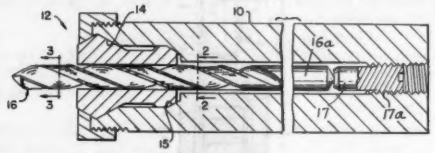
TWIST DRILL

Carl J. Oxford, Jr., Rochester, Mich., assignor to National Twist Drill & Tool Co., Rochester, Mich.

Filed Apr. 7, 1969, Ser. No. 813,859
Int. Cl. B23b *51/02*
U.S. Cl. 408—210 4 Claims

Numerical control drill system employing stubbing collet,

and a double-margin drill for improving support and rotational accuracy by the collet, that portion of the drill extending beyond the collet having the trailing margin removed.

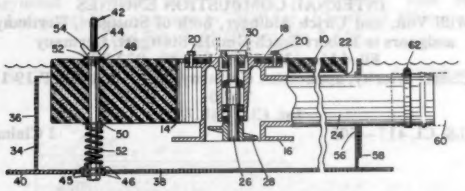


3,598,501

FLOATING SURFACE SKIMMER WITH CONTINUOUS WEIR

Howard E. Stanfield; Gary W. Stanfield, and George F. Camp, all of Tulsa, Okla., assignors to Acme Products Incorporated, Tulsa, Okla.

Filed Nov. 28, 1969, Ser. No. 880,594
Int. Cl. F01d *25/28*
U.S. Cl. 415—7 **9 Claims**



A floating pump assembly having a substantially continuous weir formed from a closed bottom and a substantially continuous vertical side portion, the side portion having a substantially continuous and horizontal side edge which is adjustable relative to the surface of liquid upon which the assembly floats; the assembly is provided with a pump whose inlet communicates with the interior of the weir and an exhaust outlet or hose for directing the removed layer to a remote location; in one embodiment, the assembly is provided with an inner weir or bowl to limit the effect of cavitation.

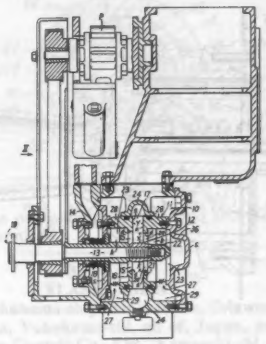
3,598,502

CENTRIFUGAL PUMPS

Harold Philip Sidney Paish; Harold Lloyd Dagwell, and Peter John Anley, all of 53b Southwark Street, London, S.E.1, England

Filed Mar. 13, 1969, Ser. No. 807,061
Claims priority, application Great Britain, Mar. 14, 1968, 12485/68
Int. Cl. F01d *25/00;* **F04d** *7/00*
U.S. Cl. 415—98 **4 Claims**

A centrifugal pump for pumping liquid in which pieces of contaminating material may be present; the pump comprising a reservoir chamber, an impeller casing, a rotary impeller mounted to rotate in an annular space within the casing which is formed with at least one inlet to the eye of the impeller and is mounted at least partly within said chamber, and a volute; and the pump being characterized in that a subchamber from which said inlet opens is provided and is formed with an inflow opening which is so dimensioned that it presents a passageway which is at least as restricted to the passage of pieces of contaminating material as are each of the passageways presented by, firstly, the inlet to the eye to the impeller, secondly, the annular space in which the impeller rotates, and, thirdly, the volute and other waterways in the pump.

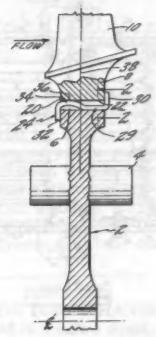


3,598,503

BLADE LOCK

Gerard Muller, Morristown, N.J., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 19, 1969, Ser. No. 859,423
Int. Cl. F01d *5/32*
U.S. Cl. 416—221 **2 Claims**



A turbomachine having a rotor assembly construction wherein a deformable blade lock is inserted in the clearance between the blade root and a slot in the periphery of a disc, the blade lock moving under the influence of centrifugal force in such a manner so as to prevent axial movement of the blade root in the disc slot.

3,598,504

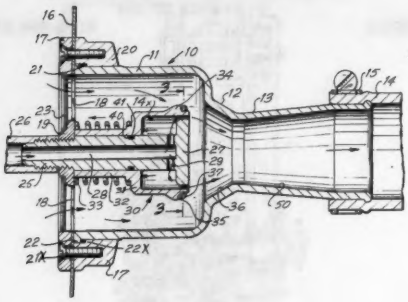
SELF-REGULATING ASPIRATOR

Vincent F. Siravo, 20 Limerick Place, Hazlet, N.J.

Filed Oct. 29, 1969, Ser. No. 872,236
Int. Cl. F04f *5/48*
U.S. Cl. 417—184 **6 Claims**

This invention relates to a self-regulating device for inflating emergency survival equipment such as is used on airplanes and it uses highly compressed air from a tank to entrain a large amount of atmospheric air to increase the volume of the inflation air obtainable only from the tank. The device comprises a cylindrical housing having a valve seat therein, a centrally disposed outlet conduit of unique construction for emission of the compressed gas from the

tank, and a coacting spring-loaded piston also of unique construction and adapted to engage said valve seat of said hous-

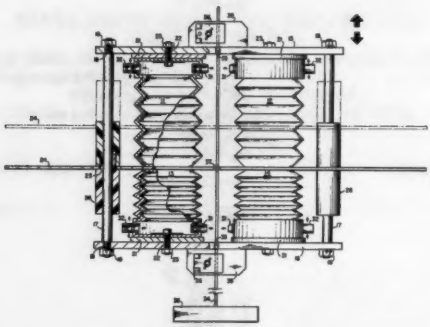


ing to seal off the fully inflated equipment from the atmosphere.

3,598,505
BELLOWS PUMP

Michael L. Greene, Hillcrest Heights, Md., and Joseph R. Jadamec, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 24, 1969, Ser. No. 869,127
Int. Cl. F04b *17/00, 35/00, 43/00*
U.S. Cl. 417—330 **5 Claims**



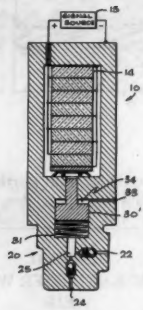
This invention relates to a bellows-type pump connected to a cable and lowered into surrounding waters for operation as the cable is moved up and down due to wave action or mechanically. A plate secured relative to the bellows is constrained against movement by the water thereby compressing and releasing the bellows from compression to provide pumping action.

3,598,506
ELECTROSTRICTIVE ACTUATOR

Cormac Garrett O'Neill, Castro Valley, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed Apr. 23, 1969, Ser. No. 818,678
Int. Cl. F04b *19/00;* **H01v** *7/00*
U.S. Cl. 417—383 **15 Claims**

Apparatus is disclosed for doing useful work with electroexpansive material which expands volumetrically in response to an electric field. The material is disposed in a chamber of a fixed volume slightly greater than the volume of the material at rest. The volume intermediate the material and the chamber is filled with a fluid having good insulation properties. When the material expands in response to an electrical signal, insulating fluid is forced out of a passage in a wall of the chamber and performs work by actuating a plunger or diaphragm. Means, such as an intermediate piston, may be employed to isolate the insulating fluid from

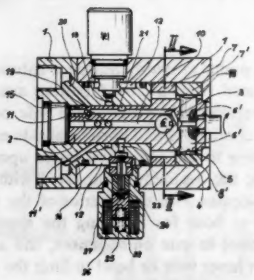


the hydraulic fluid in a device being thus hydraulically driven, such as a pump valving means or fluid control valve.

3,598,507
FUEL INJECTION PUMP FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Willi Voit, and Ulrich Aldinger, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 26, 1970, Ser. No. 022,883
Claims priority, application Germany, Apr. 18, 1969, P 19 19 707.0
Int. Cl. F04b *7/00*
U.S. Cl. 417—505 **2 Claims**



In a fuel injection pump including a rotary distributor with radially operating pump pistons, in order to increase the total number of delivery strokes, said distributor houses two radial pump assemblies supplied by a sole suction chamber and operating with a phase shift of 90°.

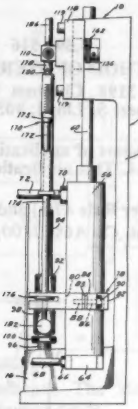
3,598,508
PRECISION FLUID DISPENSER

John D. Reid, Monrovia, and William M. Sheppard, Whittier, both of, Calif., assignors to Hamilton Company, Whittier, Calif.

Filed Apr. 7, 1969, Ser. No. 814,072
Int. Cl. F04b *17/00;* **F01b** *15/00*
U.S. Cl. 417—400 **10 Claims**

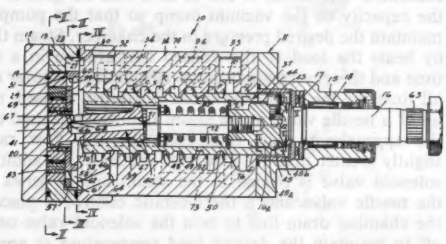
An apparatus is described for repeatably dispensing precise quantities or amounts of liquid. An actuator operates a reciprocable syringe plunger for drawing liquid into the syringe and discharging same. A valve controls the inflow and outflow of the syringe and spaced permanent magnets hold the movable member of the valve in a position for connecting

the syringe either with a source of liquid or in a position for connecting the syringe with a conduit for conveying



discharged liquid, until the syringe plunger has been moved by the actuator to the respective ends of its stroke.

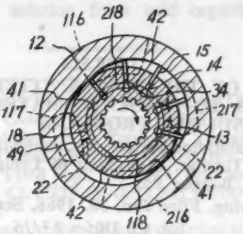
3,598,509
HYDRAULIC DEVICE
Raymond L. Goff, and Fredrick D. Venable, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Filed Feb. 3, 1970, Ser. No. 8,349
Int. Cl. F01c *1/00*
U.S. Cl. 418—61 **14 Claims**



A hydraulic device having a pair of fluid displacement members including an internally toothed stator and an externally toothed rotor disposed in meshing relation within the stator for relative orbital and rotational movement therewith to provide a series of expanding and contracting fluid pockets between the teeth thereof. The rotor has one less tooth than does the stator, and a fluid commutator valve is provided for directing fluid into and out of the fluid pockets in timed relation with the expansion and contraction thereof. The commutator valve is connected to the rotor for joint orbital and rotational movement and includes a radial wall facing the fluid pockets and having a plurality of ports formed therein arranged in a circular pattern and equaling in number twice the number of teeth of the rotor.

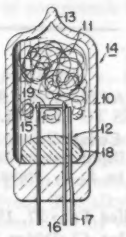
3,598,510
VANE PUMP
Yasuo Aoki, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho (Komatsu Ltd.), Tokyo, Japan
Filed Feb. 24, 1970, Ser. No. 13,376
Claims priority, application Japan, Feb. 27, 1969, 44/14,874
Int. Cl. F01c *21/00;* **F03c** *3/00;* **F04c** *15/00*
U.S. Cl. 418—81 **3 Claims**

A vane pump having two inner sidewalls of the housing, in which specified passages for pressure are provided in the walls, and, in addition, the vane may be provided with at least a radial slit on the radially inner part of the forward surface thereof, whereby the pressure pushing the vane outwardly against the circumferential wall of the cam ring is made about constant throughout the entire course of the vane including the sucking region and the exhausting region,



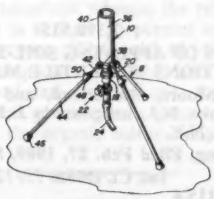
and therefore, the pumpability is improved and the vibration and noise are minimized.

3,598,511
FLASHLAMPS
Kenji Ohmae, Yokohama-shi; Namio Iwata, Odawara-shi, and Osamu Nomura, Yokohama-shi, all of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 8, 1969, Ser. No. 864,860
Claims priority, application Japan, Oct. 9, 1968, Aug. 25, 1969, 73347/68;80125/69
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **8 Claims**



A flashlamp comprises a transparent bulb with its internal volume 2.0 cc. or less, a luminescent material, combustion-assisting gas having 100 to 130 percent by weight of the chemical equivalent necessary for combustion of said material, and first and second main lead-in wires supporting a filament. Said first wire has a diameter of 0.2 to 0.6 mm. The lamp further includes an auxiliary lead-in wire disposed in parallel with the first wire and spaced therefrom by 75 percent or less of its diameter as of the diameter of said first wire.

3,598,512
TRIPOD TORCH HANDLE
Joseph N. Johnson, 2795 N. Ludlow Road, Urbana, Ohio
Filed Oct. 8, 1969, Ser. No. 864,698
Int. Cl. F23d *13/24;* **F23c** *5/06*
U.S. Cl. 431—343 **6 Claims**



A vane contrivance, more particularly, a self-standing tripodal base is provided at the upper end with a dual purpose gas burner assembly wherein addition, inner air and gas mixing tube is confined within an outer air and gas mixing tube. When the combustible mixture is burned at low pressure at the smaller and shorter inner tube a Bunsen burner flame is attainable. When the mixture is burned atop the larger and longer outer tube at requisite high exhausting a blowtorch flame is provided. When the pivotally mounted legs of the tripod are folded together, a practical and convenient blowtorch handle is provided.

CHEMICAL

3,598,513

METHOD OF TREATING KNITTED SYNTHETIC FABRICS TO SIMULATE MATELASSE CLOTH AND RESULTING PRODUCTS

Louis C. Galatioto, Bangor, Pa., assignor to Blue Ridge-Winkler Textiles, a Division of Lehigh Valley Industries, Inc., Bangor, Pa.

No Drawing. Filed Jan. 30, 1968, Ser. No. 701,571

Int. Cl. D06m *13/16*

U.S. Cl. 8—114.5 6 Claims

Treating fabrics of synthetic fibers, such as nylon and Dacron, which are of knitted structure, in such a manner that they acquire the properties, characteristic textures and designs of Matelasse cloth. This is effected by placing on the knitted goods a fine mesh screen, having such intaglio design formed in fine perforations therethrough, applying to and through the perforations of the screen a paste containing a gum and a liquid contracting agent which is penetrative of the screen and of the fibers of the fabric without diffusion or dispersion, followed by removing the screen and developing the design by drying and heating the treated material.

3,598,514

METHODS OF APPLYING SOIL-RELEASE COMPOSITIONS TO TEXTILE MATERIALS

Stephen B. Sello, Cedar Grove, Ildo Emil Pensa, Palisades Park, and Bipinchandra R. Shukla, East Paterson, N.J., assignors to J. P. Stevens and Co., Inc., New York, N.Y.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,045

Int. Cl. D06m *13/12*

U.S. Cl. 8—115.6 5 Claims

Textile materials containing substantial proportions of cellulosic and/or hydrophobic constituents are provided with both durable-press and soil-release properties by depositing on said textile materials acid catalyzed durable-press resin precursor; polyether derivative selected from the group consisting of polyalkylene glycols, the mono- and di-fatty acid esters of polyalkylene glycols, and the mono- and di-alkyl ethers of polyalkylene glycols, and their mixtures; fluorocarbon polymer, and a catalytic quantity of acidic catalyst. The fluorocarbon polymer contains highly fluorinated oleophobic and hydrophobic portions and nonfluorinated hydrophilic portions.

3,598,515

METHODS OF APPLYING SOIL-RELEASE COMPOSITIONS TO TEXTILE MATERIALS

Donald R. Moore, Rutherford, and Stephen B. Sello, Cedar Grove, N.J., assignors to J. P. Stevens and Co., New York, N.Y.

No Drawing. Filed Feb. 27, 1969, Ser. No. 803,112

Int. Cl. D06m *13/12*

U.S. Cl. 8—115.6 6 Claims

Textile materials containing substantial proportions of cellulosic and/or hydrophobic constituents are provided with both durable-press and soil-release properties by depositing on said textile materials acid catalyzed durable-press resin precursors; acrylic acid type polymer selected from the group consisting of acrylic acid type homopolymers, copolymers and terpolymers; fluorocarbon polymer; and polyol derivative. The fluorocarbon polymer contains highly fluorinated oleophobic and hydrophobic portions and nonfluorinated hydrophilic portions.

3,598,516

METHOD OF STERILIZING

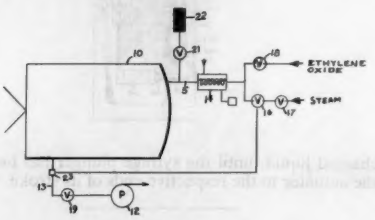
James J. Shull, 3198 Chestnut St., Philadelphia, Pa. 19107, and Robert S. Lloyd, 905 Marshall Drive, Erie, Pa. 16505

Continuation-in-part of application Ser. No. 414,721, Nov. 30, 1964. This application Jan. 2, 1969, Ser. No. 860,447

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. A61l *1/00, 13/00*

U.S. Cl. 21—57 5 Claims



The sterilizing process is carried out in a sealed container or autoclave wherein air in the chamber is displaced with steam while the chamber is maintained at vacuum condition. The steam is fed in at a rate no greater than the capacity of the vacuum pump so that the pump will maintain the desired pressure in the chamber. Steam thereby heats the load to the desired temperature in a short time and thereby creates a more efficient and shorter overall time for the sterilizing cycle. A control is used, made up of a needle valve in the steam line which is used to set the approximate flow rate. Actually, this flow rate is slightly greater than the flow rate required. An additional solenoid valve is placed in the steam line in series with the needle valve and a thermostatic control is placed in the chamber drain line to turn the solenoid valve on and off to maintain the desired load temperature at approximately 130° F.

The turning on and off of the solenoid valve to modulate the drain line temperature sets up a pulsing flow of steam and steam pressure condition of approximately 25 to 30 in. Hg which helps to purge the load of entrained air thereby heating the load more rapidly. Following the simultaneous application of vacuum and steam, a microbiocidal chemical sterilizing gas is admitted to the sterilizing chamber.

3,598,517

AUTOMATIC CONTROL FOR BALANCED PRESSURE PROCESS

Donald J. Beecher, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

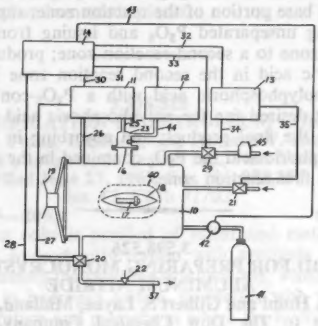
Filed May 12, 1969, Ser. No. 827,471

Int. Cl. A61l *1/00, 13/00*

U.S. Cl. 21—58 11 Claims

A process and apparatus for sterilizing articles sealed in packages made of semi-permeable membranes, and with or without porous overwrap, in a sealed chamber in an atmosphere of permeable gas. A control is provided for regulating the pressure in the chamber to limit the differential pressure between the pressure inside the package and the pressure in the chamber to a predetermined value so that the pressure inside the package will never be such as

to rupture the package and the chamber pressure will not exert a pressure on the outside of the package which

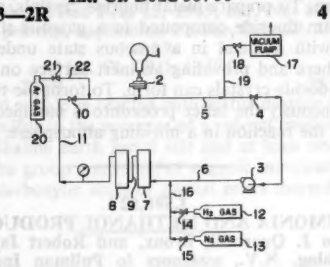


might damage its contents. The sterilizing gas is an epoxide, preferably ethylene oxide.

3,598,518
METHOD OF PROVIDING A CONTAINER WITH AN OXYGEN-FREE GAS

Eizo Goto, Chigasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 8, 1968, Ser. No. 719,568
Claims priority, application Japan, Apr. 11, 1967, 42/22,591; Sept. 9, 1967, 42/57,547
Int. Cl. B01d *53/00*
U.S. Cl. 23—2R **4 Claims**



Method of providing a container with an oxygen-free gas comprising purging the container with a hydrogen containing gas, withdrawing the gaseous mixture from the container, catalytically reacting the oxygen and hydrogen to form water, removing the water and recycling the gas to the container.

3,598,519
PURIFICATION OF MOLYBDENUM

Vincent Chiola, Towanda, Phyllis R. Dodds, Wysox, John A, Powers, New Albany, and Clarence D. Vanderpool, Towanda, Pa., assignors to Sylvania Electric Products Inc.

Filed June 30, 1969, Ser. No. 837,777
Int. Cl. C22b *59/00*
U.S. Cl. 23—22 **4 Claims**

A process for separating molybdenum values from various impurities is disclosed. The process comprises dissolving a contaminated molybdenum source in an aqueous sulfuric acid solution to form an aqueous acidic feed solution, contacting the feed solution with a water-insoluble organic evtractant solution comprising a tertiary alkyl amine and a water-insoluble hydyrocarbon solvent, thereby selectively extracting the molybdenum values into said organic solution and stripping the organic solution with an aqueous strip solution containing ammonium ions and ammonium molybdate to thereby form an aqueous ammonium molybdate solution and thereafter separating said molybrate solution from said organic extractant solution.

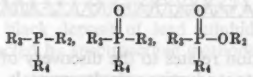
3,598,520
SEPARATION OF RARE EARTHS

Vincent Chiola, George J. Kamin, Tai K. Kim, Robert E. Long, Jr., and Robert J. Patrician, Towanda, Pa., assignors to Sylvania Electric Products Inc.

No Drawing. Filed Sept. 16, 1969, Ser. No. 858,515
Int. Cl. C22b *59/00*; **C01f** *17/00*
U.S. Cl. 23—22 **6 Claims**

An improvement to the solvent extraction step of a process for the purification of rare earths comprising contacting an aqueous feed solution containing light and heavy rare earth elements with a solvent extraction solution consisting essentially of an alkyl phosphoric acid having the formula

wherein R is a straight chain alkyl group having from about 8 to about 16 carbon atoms and R_1 is selected from hydrogen and R, an organophosphorus compound selected from the group of compounds having the formulas consisting of



and mixtures thereof wherein R_2 is an alkyl group having from about 4 to about 8 carbon atoms and R_3 and R_4 are each selected from the group consisting of H, R_2 and OR_2, and a hydrocarbon solvent. The alkyl phosphoric acid is from about 3.5% to about 35% by volume of the extraction solution and the organophosporus compound is from about 2% to about 25% of the extraction solution and the remainder is the hydrocarbon solvent.

3,598,521
REMOVAL OF SULFUR COMPOUNDS FROM GAS STREAMS

Forrest C. Alley, Clemson, S.C., assignor to Westvaco Corporation

No Drawing. Filed Dec. 11, 1968, Ser. No. 783,150
Int. Cl. B01d *53/04, 53/34*
U.S. Cl. 23—25 **7 Claims**

A process for removing malodorous organic sulfur compounds and hydrogen sulfide from industrial gas streams which comprises contacting the sulfur compound-containing gas and an oxygen-containing gas with a carbonaceous adsorbent wherein the relative humidity at initial contact is at least 70 percent and the contact temperature is between 27° C. and 82° C., whereby the organic sulfur compounds and hydrogen sulfide are adsorbed, or oxidized and adsorbed onto the carbonaceous adsorbent, and the gas stream is passed to the atmosphere free from the organic sulfur compounds and hydrogen sulfide.

3,598,522
CONVERSION OF POTASSIUM-MAGNESIUM DOUBLE SALTS INTO KAINITE

William J. Lewis, South Ogden, Utah, assignor to National Lead Company, New York, N.Y.

Filed July 18, 1968, Ser. No. 745,904
Int. Cl. C01d *5/12, 11/00*; **C01f** *5/00*
U.S. Cl. 23—50 **6 Claims**

Method of converting double salts of potassium and magnesium, such as leonite and picromerite, into kainite, comprising moistening said double salt with an aqueous

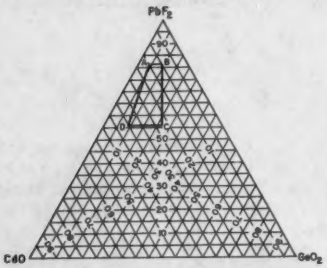
solution of magnesium chloride, preferably to the extent of at least 10% by weight thereof, said magnesium chloride solution containing preferably at least 20% by weight of said chloride, and aging at temperature of about 25–40° C. for a period sufficient to effect said conversion, preferably for a period of at least 48 hours.

3,598,523

METHOD OF PRODUCING CADMIUM ORTHO-GERMANATE

Kenneth O. Beck, Newton, Mass., and Shou-Ling Hou, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 11, 1968, Ser. No. 697,237
Int. Cl. G01g *17/00*
U.S. Cl. 23—51 **4 Claims**



This invention relates to the discovery of a method for growing photoconductive single crystals of cadmium ortho-germanate (Cd_2GeO_4) from a saturated solution of cadmium oxide (CdO), germanium oxide (GeO_2), and lead fluoride (PbF_2) and the use of the crystals.

3,598,524

PRODUCTION OF SODIUM PERBORATE

Victor J. Reilly, Memphis, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 25, 1968, Ser. No. 762,625
Int. Cl. C01b *15/12, 35/00;* **B01d** *9/02*
U.S. Cl. 23—60 **6 Claims**

A process for producing sodium perborate having a relatively low bulk density and a relatively high solution rate wherein sodium metaborate and hydrogen peroxide are fed to and reacted in an aqueous reaction slurry of sodium perborate from which the sodium perborate is crystallized in more than one crystallization zone. The crystallization in the first zone is effected in the presence of a relatively high concentration of excess sodium metaborate and the completion of the crystallization is effected in one or more subsequent zones in the presence of a relatively low concentration of excess sodium metaborate resulting from the addition of hydrogen peroxide to the slurry in the subsequent crystallization zone.

3,598,525

PROCESS FOR THE MANUFACTURE OF P_2O_5 AND POLYPHOSPHORIC ACID

Heinz Harnisch, Lovenich, near Cologne, Fritz Krahl and Friedrich Thomas, Hermulheim, near Cologne, and Herbert Panter, Alstadten, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Cologne, Germany

Filed Oct. 21, 1968, Ser. No. 679,298
Claims priority, application Germany, Nov. 30, 1967, P 16 67 577.7
Int. Cl. C01b *25/20, 25/24*
U.S. Cl. 23—165 **7 Claims**

Solid P_2O_5 and polyphosphoric acid are produced simultaneously by burning, in the upper portion of a first reaction zone whose walls are cooled down to temperature lower than 150° C., molten elementary phosphorus with a molecular oxygen-containing gas; condensing a portion of resulting gaseous P_2O_5 in the reaction zone and transforming it into solid P_2O_5; discharging the solid P_2O_5 from the base portion of the reaction zone; supplying gas containing unseparated P_2O_5 and issuing from the said reaction zone to a second reaction zone; producing polyphosphoric acid in the second reaction zone by cycling therein polyphosphoric acid with a P_2O_5-content lower than that desired for the polyphosphoric acid to be produced as the final product; and absorbing in the cycled polyphosphoric acid the P_2O_5 contained in the gas issuing from the first reaction zone.

3,598,526

METHOD FOR PREPARING MONOCRYSTALLINE ALUMINUM NITRIDE

James O. Huml and Gilbert S. Layne, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Application Apr. 27, 1967, Ser. No. 634,112, now Patent. No. 3,477,812, dated Nov. 11, 1969, which is a continuation-in-part of application Ser. No. 507,974, Nov. 15, 1965. Divided and this application Dec. 9, 1968, Ser. No. 803,502
Int. Cl. C01b *21/06;* **C01f** *7/00*
U.S. Cl. 23—192 **3 Claims**

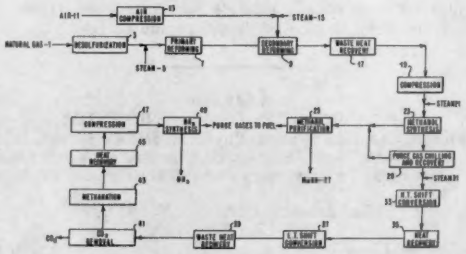
A process for producing aluminum nitride and metal fluoride single crystals either separately or simultaneously. The process comprises contacting a subvalent aluminum compound, i.e. where Al exhibits a valence of less than 3, in a gaseous state with a nitriding agent in a gaseous state while providing an inert surface on which the crystals can form. To prepare metal fluoride crystals, a subvalent aluminum fluoride compound in a gaseous state is contacted with a metal in a gaseous state under an inert atmosphere and providing an inert surface on which the metal fluoride crystals can form. To form the two crystals simultaneously the latter procedure is modified by carrying out the reaction in a nitriding atmosphere.

3,598,527

AMMONIA AND METHANOL PRODUCTION

Orlando J. Quartulli, Bronx, and Robert Jay Kandall, Flushing, N.Y., assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 11, 1968, Ser. No. 766,723
Int. Cl. C01c *1/04, 29/16;* **B01j** *9/00*
U.S. Cl. 23—199 **10 Claims**



A process is provided for the manufacture of methanol and ammonia comprising operating sequentially a high pressure hydrocarbon reforming zone in series with a low pressure methanol synthesis zone, in series with a water shift conversion zone, in series with a carbon dioxide removal zone, in series with an ammonia synthesis zone. Such combination takes advantage of the newly developed

low pressure methanol process and thereby saves substantial operating costs in carbon dioxides compression in addition to substantially investment costs by utilizing a single process train instead of the heretofore employed independent methanol and ammonia plants.

3,598,528
PURIFICATION OF PETROLEUM COKE
William F. Franz, Gardiner, and Howard V. Hess, Glenham, N.Y., assignors to Texaco Inc., New York, N.Y.
Filed June 27, 1969, Ser. No. 837,254
Int. Cl. C01b *31/02*
U.S. Cl. 23—209.9 6 Claims

Petroleum coke is purified of sulfur and metallic impurities by hydrodesulfurization with synthesis gas followed by passing the resulting synthesis gas, which is relatively rich in hydrogen sulfide, in contact with the coke at a temperature and pressure at which the hydrogen sulfide catalyzes the reaction of the metallic impurities with carbon monoxide to form gasiform metallic carbonyls which can be physically separated from the coke.

3,598,529
PROCESS FOR CONVERTING HYDROGEN SULFIDE AND SULFUR DIOXIDE TO ELEMENTAL SULFUR
André Deschamps, Chatou, and Philippe Renault, Neuilly-sur-Seine, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, Hauts-de-Seine, France
No Drawing. Filed Feb. 19, 1969, Ser. No. 800,761
Claims priority, application France, Feb. 29, 1968, 141,894
Int. Cl. C01b *17/04*
U.S. Cl. 23—225R 28 Claims

Hydrogen sulfide is reacted with sulfur dioxide to form elemental sulfur in the persence of a solvent containing an alkali or alkaline earth metal salt and at least one member from the group consisting of organic monocarboxylic acids, polycarboxylic acids or partial esters thereof.

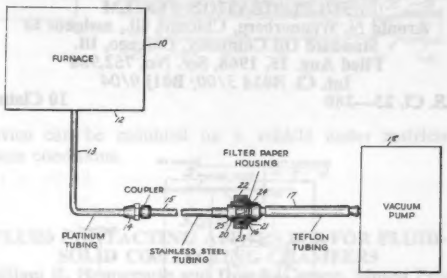
3,598,530
DETERMINATION OF UNSATURATED HYDROCARBONS
Ellsworth R. Fenske, Palatine, and Leonard F. Pasik, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Sept. 5, 1968, Ser. No. 757,799
Int. Cl. G01n *9/00, 25/18, 31/08*
U.S. Cl. 23—230 5 Claims

Method for quantitatively determining the presence of an unsaturated hydrocarbon compound contained in a mixture of compounds using improved chromatographic techniques.

3,598,531
METHOD FOR DETERMINING SULFUR AS SULFUR DIOXIDE
Elmars Bremanis, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Sept. 19, 1968, Ser. No. 760,976
The portion of the term of the patent subsequent to June 15, 1988, has been disclaimed
Int. Cl. B01k *1/00;* G01n *27/42, 31/16*
U.S. Cl. 23—230 2 Claims

Chloride compound and nitrogen interferences to the iodometric and/or microcoulometric methods of sulfur determination are overcome by adding sodium azide to the titration cell electrolyte. The improved method is applicable to oils, crudes, solids, and petrochemicals.

3,598,532
MEANS AND METHOD FOR CRUCIBLE LEAK DETECTION
Irving Adams, Cranford, N.J., and Richard F. Friedrich, Brooklyn, N.Y., assignors to Loral Corporation, Scarsdale, N.Y.
Filed Nov. 29, 1968, Ser. No. 786,809
Int. Cl. B01d *39/14;* G01m *3/04;* G01n *33/20*
U.S. Cl. 23—230 2 Claims

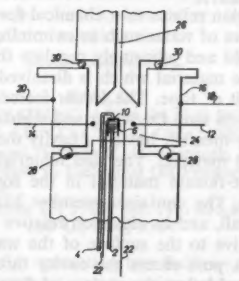


Means and method for detecting leaks in platinum crucibles during the period of crystal growth in the manufacture of synthetic chemical structures using a solvent such as lead oxide and/or lead fluoride. Leaks are detected by sampling small quantities of air in the furnace, and testing for the presence of lead or other solvents. The lead particles are trapped on a disc of filter paper, and detected by means of a chemical reaction which changes the lead to a black deposit of lead sulphide. Other elements are detected by spectroscopic methods.

3,598,533
DIAGNOSTIC PAPER STRIP
Suiichi Tomioka, Tokyo, and Motoharu Shiba and Sakae Wade, Saitama, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed Apr. 1, 1969, Ser. No. 818,855
Claims priority, application Japan, Apr. 4, 1968, 43/21,742
Int. Cl. G01n *31/22, 33/16*
U.S. Cl. 23—230 12 Claims

An improved diagnostic paper strip which is applicable to whole blood sample, which is prepared by dipping a diagnostic paper strip into an organic solvent solution of one or more of cholesterol, rosin and their esters and drying the strip.

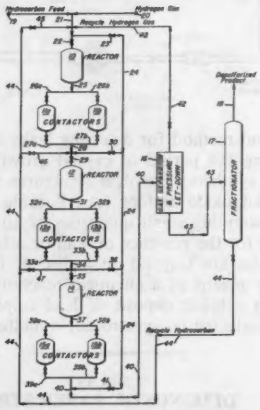
3,598,534
MIXING DEVICE
Charles E. Templer, 20 Mattock Lane, Ealing, London, W. 5, England
Filed July 29, 1968, Ser. No. 748,292
Claims priority, application Great Britain, Aug. 5, 1967, 36,052/67
Int. Cl. G01k *17/00;* G01n *25/48*
U.S. Cl. 23—253 9 Claims



A mixing device is provided for mixing small quantities of liquids together in which at least two tubes pass into a

larger tube closed at one end, the open end of each tube within the larger tube almost meeting and preferably facing the open end of each other tube. The device is used in microcalorimeters for determining heats of reaction.

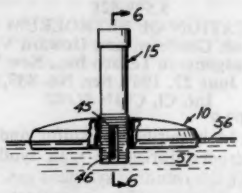
3,598,535
SEQUENTIAL, FIXED-BED HYDRODESULFURIZATION SYSTEM
Arnold N. Wennerberg, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.
Filed Aug. 15, 1968, Ser. No. 752,986
Int. Cl. B01d *3/00;* **B01j** *9/04*
U.S. Cl. 23—260 **10 Claims**



An apparatus for the hydrodesulfurization of sulfur-containing hydrocarbons wherein the hydrocarbon is reacted in a first stage with hydrogen in the presence of a hydrogen transfer catalyst to produce H_2S, and wherein the H_2S so produced is reacted with an alkaline material in a second stage to produce a solid phase sulfide before it can combine with the desulfurized hydrocarbons. The invention is particularly useful in hydrodesulfurizing asphaltic and reduced crudes. A series of the aforementioned stages may be linked together to form an efficient hydrodesulfurization system.

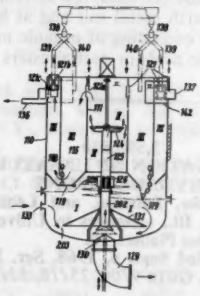
3,598,536
CHEMICAL FEEDER
John W. Christensen, 10534 Wiley Burke, Downey, Calif. 90241
Continuation of application Ser. No. 719,455, Aug. 8, 1968. This application May 4, 1970, Ser. No. 34,116
Int. Cl. B01f *1/00*
U.S. Cl. 23—267A **22 Claims**

This invention relates to a chemical feeder suitable for use with bodies of water such as swimming pools. Its purpose is to hold and adjustably regulate the quantity of a slowly soluble material which is dissolved into a body of water per unit of time. The feeder includes a float member which floats atop the water and which has engaged to it a container member having a cavity therein which contains the said material. The said material will frequently be a chlorine-release material in the form of relatively small pellets. The container member has a bottom wall and a side wall, and its elevation relative to the float, and thereby relative to the surface of the water, is vertically adjustable. A port enters the cavity through one of the walls at a level below the surface of the water so that the water will rise in the cavity to the same level as that of the surface. The amount of surface area of the material which is exposed to solution by the water is adjustable at least in part by raising and lowering the container member, because the water level will thereby be higher or lower in the stack of material in the container member. The size of the container member permits a substantial reserve supply



of the material above the water level so that as the material is dissolved below the water level, additional material falls by gravity to a level below the water surface so as to maintain sensibly constant the available surface area of material available to be dissolved.

3,598,537
CONTINUOUS LIQUID EXTRACTION OF SOLUBLES FROM SOLIDS
Alfred Kraft, Kronberg, Taunus, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed June 5, 1968, Ser. No. 734,606
Int. Cl. B01d *11/02, 15/02, 21/10*
U.S. Cl. 23—272.5 **3 Claims**

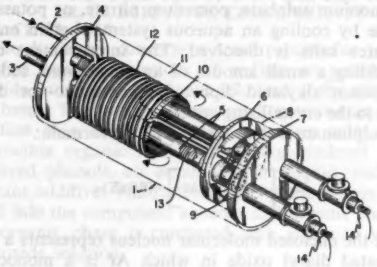


Liquids and solid material are in countercurrent flow through a plurality of mixing zones of which one is composed of a plurality of pockets interconnected with each other. Solid material is periodically passed through each pocket and partially recycled, while extracted material is withdrawn. Overall extraction time is substantially lessened.

3,598,538
DIRECTLY HEATED GAS DISSOCIATOR
Arnold Peacock, Cape Elizabeth, Maine, assignor to Sylvania Electric Products Inc.
Filed Sept. 5, 1968, Ser. No. 757,723
Int. Cl. B01j *7/00;* **H05b** *3/02*
U.S. Cl. 23—281 **4 Claims**

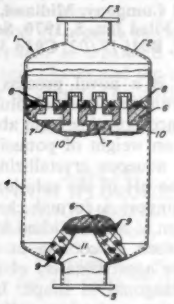
A gas dissociator includes a heating element made of refractory metal resistance wire and having a cyclical spiral shape. The gas is caused to flow turbulently

through the element and is heated to its dissociation temperature. Efficient heat transfer from the element to



the flowing gas results in substantially complete dissociation without the requirement of a catalyst.

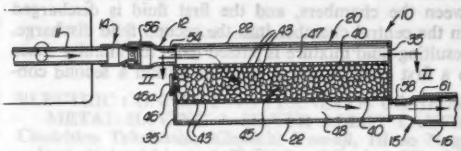
3,598,539
VESSEL FOR CONTACTING FLUIDS AND A BED OF GRANULAR SOLIDS
Antonio B. Pizzato, Tokyo, Japan, assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Dec. 11, 1968, Ser. No. 783,026
Int. Cl. B01d *53/04;* **B01j** *9/00, 9/04*
U.S. Cl. 23—288 **5 Claims**



An improved vessel for contacting fluids and a bed of granular solids wherein the fluid passes through the aforesaid bed. A plurality of basket shaped screens are partially embedded in the aforesaid bed of granular solids. That portion of each screen having the greatest surface area is the portion most deeply embedded.

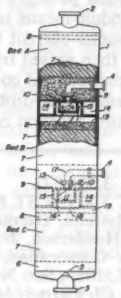
3,598,540
CATALYTIC EXHAUST GAS PURIFYING DEVICE AND CASING MEANS THEREFOR
Sidney Chase, 11914 Darlington, Apt. 4, Los Angeles, Calif. 90049
Filed Apr. 2, 1969, Ser. No. 812,818
Int. Cl. B01j *9/00*
U.S. Cl. 23—288 **5 Claims**

A catalytic exhaust gas purifying device utilizing a bed of catalytic material and including a casing means and venturi means constructed and arranged to provide decreased warmup time for commencing operation of the device and to utilize a mode of construction of the casing means and venturi means which enhances not only operating efficiency but also the facility by which the



device can be mounted on a vehicle under restricted space conditions.

3,598,541
FLUID CONTACTING APPARATUS FOR FLUID-SOLID CONTACTING CHAMBERS
William R. Hennemuth and Don B. Carson, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed June 23, 1969, Ser. No. 835,449
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 **12 Claims**

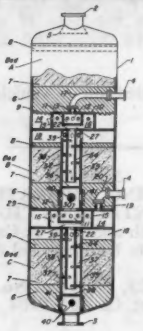


An apparatus for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is passed into a central chamber having a plurality of fluid openings in the chamber wall, while a second fluid is passed into an annular chamber encompassing the central chamber and spaced apart therefrom. The second fluid is discharged via fluid openings in the inner annular chamber wall, into an annular space between the chambers, and the first fluid is discharged from the central chamber into the second fluid discharge. A resulting fluid mixture is passed from the annular space into a bed of particulated contact solids. Specific application is in hydrogenation, hydrotreating, hydrocracking, and hydrodealkylation reaction zones.

3,598,542
FLUID CONTACTING APPARATUS FOR FLUID-SOLID CONTACTING CHAMBERS
Don B. Carson and William R. Hennemuth, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed June 23, 1969, Ser. No. 835,679
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 **26 Claims**

An apparatus for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is passed into a central chamber having a plurality of fluid openings in the chamber wall,

while a second fluid is passed into an annular chamber encompassing the central chamber and spaced apart therefrom. The second fluid is discharged via fluid openings in the inner annular chamber wall, into an annular space between the chambers, and the first fluid is discharged from the central chamber into the second fluid discharge. A resulting fluid mixture is passed from the annular space into a first conduit means confined within a second con-



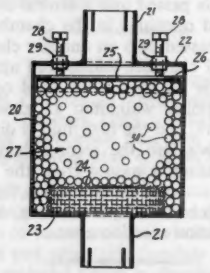
duit means in a first direction of flow. The mixture is then passed into an annular passageway confined between the first and second conduit means in a second direction of flow substantially counter-current to the first direction of flow. The mixture is then passed from the annular passageway into a bed of particulated contact solids. Specific application is in hydrogenation, hydrotreating, hydrocracking, and hydrodealkylation reaction zones.

3,598,543

CATALYTIC EXHAUST PURIFIER

Howard M. Crosby, Marietta, Herman Z. Fordham, Atlanta, and John H. Henderson, Jr., Marietta, Ga., assignors to Kleen Air Corporation, Marietta, Ga.

Filed June 25, 1969, Ser. No. 836,433
Int. Cl. F01n *3/14*
U.S. Cl. 23—288F **1 Claim**



A diesel or like exhaust gas purifier or converter consisting of a casing connected directly into the exhaust pipe and having a chamber or chambers for preferably high density, low surface area alumina spheres which have been previously impregnated with a catalytic agent such as a platinum salt or a mixture of cobalt and calcium salts or the like. An adjustable foraminous baffle or baffles is provided in the casing so that the alumina spheres may be pressed into contacting relation in a catalytic chamber where exhaust purification occurs as the exhaust gas flows through such chamber.

3,598,544

CRYSTAL MODIFICATION OF INORGANIC SALTS

Arthur S. Teot, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,405
Int. Cl. B01d *9/02;* **B01j** *17/04*
U.S. Cl. 23—300 **3 Claims**

Disclosed herein is an improved method for crystallizing ammonium sulphate, potassium nitrate, or potassium chromate by cooling an aqueous system wherein one of these three salts is dissolved. The improvement comprises adding a small amount of an ammonium, sodium, or potassium alkylated diphenyl ether mono- or disulphonate to the crystallizing system.

The sulphonate is characterized by the formula:

$$R_n\left[Ar-O-Ar\right]_{-(SO_2X)_m}$$

wherein the enclosed molecular nucleus represents a nonhalogenated diaryl oxide in which Ar is a monocyclic aromatic radical of the benzene series, R is a hydrophobic substituent containing from 8 to 48 carbon atoms, inclusive in continuous carbon-carbon bonds, n is an integer from 1 to 3, and m is an integer from 1 to 2.

The "X" portion of the sulphonate group is a hydrogen displaceable ion. Suitable ions are sodium, potassium and ammonium. The resulting crystals are larger and more regularly shaped than crystals produced by prior art methods.

3,598,545

POTASSIUM SULFATE CRYSTALLIZATION PROCESS WITH THE ADDITION OF A POLYIMINE

Duane S. Lehman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 5, 1970, Ser. No. 789
Int. Cl. B01j *17/02;* **C01d** *5/00*
U.S. Cl. 23—302 **3 Claims**

Disclosed herein is a novel process for crystallizing potassium sulfate from an aqueous solution thereof. The process comprises incorporating from about 0.02 to about 0.2 percent (based on weight of potassium sulfate) of a polyimine into the aqueous crystallizing solution. Prior to crystallization, the pH of the solution is adjusted to a level sufficient to import a formal charge to the polyimine. Crystallization is accomplished by commonly employed techniques such as cooling or evaporation. The resulting crystals are approximately of the same size and are consistently hexagonal in shape. In the absence of the polyimine additive, potassium sulfate crystallizes in an unpredictable variety of forms which have poor filtering and washing characteristics.

3,598,546

PREPARING ANHYDROUS HYDRAZINE USING AN ACTIVATED ALUMINUM OXIDE DRYING AGENT

Carl D. Good, Seattle, and Donald R. Poole, Woodinville, Wash., assignors to Rocket Research Corporation of America, Redmond, Wash.

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,410
Int. Cl. B01d *15/00, 15/06;* **C01b** *21/16*
U.S. Cl. 23—307 **9 Claims**

Hydrazine, monomethyl hydrazine, dimethyl hydrazine and other closely related hydrazine compounds are presently available as liquids containing small amounts of water (e.g. 1%) which affects their properties to a very great extent. The present invention provides a physical procedure for removing such water without heating the hydrazine and without the formation of dangerous by-products.

3,598,547

EXTRACTING SODIUM AND POTASSIUM FROM AQUEOUS SOLUTIONS HAVING A pH OF 14 USING PHENOLS AND AN EXTRACTANT ADDITIVE

Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,160
Int. Cl. B01d *11/04;* C01d *1/04, 1/34*
U.S. Cl. 23—312 4 Claims

The disclosure concerns a novel process for producing purified aqueous solutions of sodium or potassium hydroxide from impure aqueous solutions of the corresponding bases. The process comprises contacting an aqueous solution of sodium or potassium values with a water-immiscible organic liquid comprising hindered and unhindered phenols, an organic carrier liquid, and an extractant additive. The resulting two phase system is separated into the component aqueous and organic phases and the organic phase is contacted with water to yield the hydroxide solution.

3,598,548

EXTRACTING SODIUM AND POTASSIUM FROM AQUEOUS SOLUTIONS HAVING A pH OF 14 USING UNHINDERED PHENOLS

Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,161
Int. Cl. B01d *11/04;* C01d *1/04, 1/34*
U.S. Cl. 23—312 6 Claims

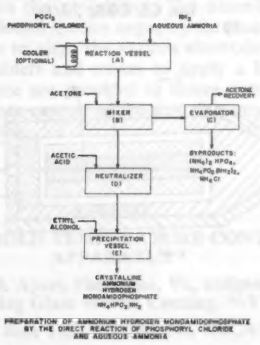
The disclosure concerns a novel process for producing purified aqueous solutions of sodium or potassium hydroxide from impure aqueous solutions of the bases. The process comprises contacting an aqueous solution of sodium or potassium values with a pH of 12 or above with a water-immiscible organic liquid comprising an unhindered phenol and an organic carrier liquid. The resulting two phase system is separated into the component aqueous and organic phases and the organic phase is contacted with water to yield the hydroxide solution.

3,598,549

AMMONIUM HYDROGEN MONOAMIDOPHOSPHATE

Richard C. Sheridan, Sheffield, Ala., assignor to Tennessee Valley Authority

Filed Feb. 14, 1969, Ser. No. 799,271
Int. Cl. C01b *25/28*
U.S. Cl. 23—357 11 Claims



PREPARATION OF AMMONIUM HYDROGEN MONOAMIDOPHOSPHATE BY THE DIRECT REACTION OF PHOSPHORYL CHLORIDE AND AQUEOUS AMMONIA

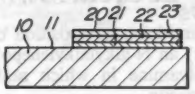
Ammonium hydrogen monoamidophosphate is prepared by treating an aqueous solution of ammonia with phosphoryl chloride. The reaction solution is mixed with acetone, and the product is recovered from the aqueous layer by neutralizing with acetic acid and precipitating with ethyl alcohol.

3,598,550

ELECTRIC CONNECTING PLANES OF COMPOSITE METAL HAVING A SILVER ALLOY LAYER

Choichiro Takahashi, Kenkichi Yamaji, Hiroo Nagano, Issei Nakanishi, and Yasuhiko Miyake, Hitachi-shi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Sept. 26, 1967, Ser. No. 670,633
Claims priority, application Japan, Dec. 28, 1966, 41/85,292
Int. Cl. B32b *15/00*
U.S. Cl. 29—199 2 Claims



An electric connecting plane comprising a base of conductive material such as copper, copper alloy, aluminum or aluminum alloy, and a clad material comprising a surface conductive layer, an intermediate conductive layer and a solder layer, cladded integrally with each other in superposed relation, and bonded to the surface of said base with heat and pressure, said surface conductive layer being formed of a material such as silver or silver alloy having a small contact resistance and being highly resistive against corrosion, said intermediate conductive layer being formed of a material such as copper, copper alloy, aluminum or aluminum alloy having a good electric conductivity, and said solder layer being formed of a composition solderable to either of copper-type and aluminum-type metals; and a method of forming said electric connecting plane comprising producing the clad material of the composition described, cleaning the bonding surfaces of said clad material and said base either mechanically or chemically and bonding the cleaned surfaces of said clad material and said base to each other with heat and pressure.

3,598,551

FUEL OIL COMPOSITIONS WITH IMPROVED POUR POINT CHARACTERISTICS

Arvid Ek, Shaler Township, Allegheny County, Edward Mitchell, Valencia, and Frederick E. Scypinski, Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Mar. 12, 1970, Ser. No. 19,099
Int. Cl. C10l *1/18, 1/24*
U.S. Cl. 44—62 4 Claims

Pour point characteristics of middle distillate fuel oils are improved by incorporating in such fuel oils about 0.001–5% by weight of an oil-soluble terpolymer of a monomeric C_2 to C_9 alkyl ester of thiolacrylic acid, a monomeric C_{10} to C_{20} alkyl ester of thiolacrylic acid and a monomeric branched-chain C_3 to C_8 alkylaminoethyl ester of methacrylic acid, said terpolymer having an average molecular weight of at least about 2,000. The terpolymer contains about 5 to about 45 percent by weight of the C_2 to C_9 alkyl ester of thiolacrylic acid, about 45 to about 85 percent by weight of the C_{10} to C_{20} alkyl ester of thiolacrylic acid and about 5 to about 15 percent by weight of the branched-chain C_3 to C_8 alkylaminoethyl ester of methacrylic acid.

3,598,552

POUR DEPRESSANTS FOR MIDDLE DISTILLATES

Charles A. Cohen, Westfield, and Herbert G. Burkard, Convent Station, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

No Drawing. Continuation-in-part of application Ser. No. 500,267, Oct. 21, 1965. This application Dec. 13, 1968, Ser. No. 783,757

Int. Cl. C10l *1/16*

U.S. Cl. 44—62 4 Claims

Petroleum middle distillate fuel oil containing as a pour point depressant a polymer of ethylene and C_{10} to C_{22} alpha monoolefin, said polymer having a molecular weight of about 1,000 to 50,000.

3,598,553

SYNERGISTIC ANTI-ICING COMPOSITION

Robert H. Rosenwald, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 29, 1968, Ser. No. 732,856

Int. Cl. C10l *1/18, 1/22*

U.S. Cl. 44—75 8 Claims

Synergistic anti-icing composition of (1) polyhydroxy alcohol and (2) an N-alkylalkylenepolyamine or N-alkylpolyalkylenepolyamine in which said alkyl contains at least one aryl group.

3,598,554

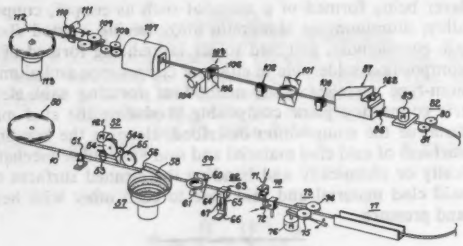
METHODS FOR PRODUCING ARMORED METAL TOOLS

Chester H. Dawson, Danbury, Robert T. Catlin and Robert O. Swain, Trumbull, and Robert J. Turton, Fairfield, Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Feb. 8, 1968, Ser. No. 703,931

Int. Cl. B24d *15/02*

U.S. Cl. 51—293 33 Claims



Methods for producing armored metal tools consisting of a tool structure composed of a base metal having over at least a surface portion thereof, a hard wearing, ductile, and adherent, abrasive coating, and according to which said surface portion of said base metal is coated with a paste flux adhesive and with particles of a powdered matrix metal, applied separately and sequentially or in admixture, and to which coating is applied an overcoating of abrasive particles of a hard, high melting, diamond substitute material, such as tungsten carbide particles and the like, the so coated portion of the tool, or alternatively the entire tool, being then heated to temperature sufficiently high to fusion bond said matrix metal particles to one another and to said base metal and into a matrix metal layer embedding said abrasive particles therein, the heated tool portion or tool being then rapidly cooled to ambient temperature permanently to bond said matrix metal layer to said base metal and permanently to embed said abrasive particles in said matrix metal layer, the thickness of said matrix metal layer being so controlled in relation to the particle size of said abrasive particles, as only partially to embed said abrasive particles therein, whereby said abrasive particles project from said layer to form a myriad of sharp cutting edges. The base metal may comprise a heat treatable, ferritic steel or alloy steel, which is hardened by the heating and cooling cycle aforesaid and which may be thereafter tempered to a desired degree of hardness and ductility.

3,598,555

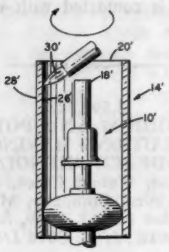
METHOD OF SEALING A METALLIC ELEMENT INTO GLASS HAVING A HIGH PERCENTAGE OF LEAD

Tony P. Gennocro, Emporium, Pa., assignor to Sylvania Electric Products Inc.

Filed May 1, 1970, Ser. No. 33,818

Int. Cl. C03c *27/02;* C03b *23/04*

U.S. Cl. 65—55 4 Claims



A method of sealing a metallic element into a seal area of a tubular glass envelope containing a high percentage of lead wherein the envelope is fixed on a mandrel and the metallic element is mounted on the mandrel. The envelope is rotated and its interior surface at the seal area is heated to a workable temperature. The exterior surface at the seal area is then heated and the seal area is shaped by a roller into a dome having a central aperture. The metallic element is then forcibly inserted into the aperture while the heating and rotating are continued.

3,598,556

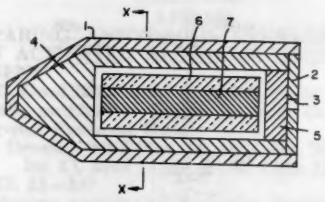
METHOD OF MAKING GLASS-METAL SEALS

James G. Hunt, Framingham Center, Mass., assignor to Whittaker Corporation, Nuclear Metals Division, West Concord, Mass.

Filed July 23, 1968, Ser. No. 746,921

Int. Cl. C03c *29/00*

U.S. Cl. 65—59 8 Claims



A method of making glass-metal seals wherein a metal rod is inserted into an elongated hole in a glass matrix. The rod and matrix composite is then inserted into an extrusion billet. The composite containing billet is then

heated to a temperature within the softening range of the glass matrix. The billet is then extruded to form a co-extrusion bonded glass-metal rod. Thereafter, an end, only, of the metallic rod is exposed by removing part of the glass matrix. Different arrangements of glass-metal seals can be formed by initially encasing the glass matrix in a first metallic sleeve and by inserting another metallic sleeve between the glass matrix and the first metallic sleeve.

3,598,557

APPARATUS FOR ASSEMBLING A MULTIPLE ELEMENT TYPE ELECTRON GUN STRUCTURE

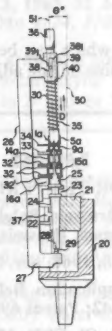
Shinichi Sawagata, Tokyo, Masakatsu Nakahara, Yokohama-shi, and Mikio Noguchi, Hyogo-ken, Japan, assignors to Tokyo Shiboura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 21, 1969, Ser. No. 818,009

Claims priority, application Japan, Apr. 25, 1968, 43/27,326; July 5, 1968, 43/46,524; Sept. 30, 1968, 43/70,598

Int. Cl. C03b *23/14*

U.S. Cl. 65—155 **8 Claims**



Apparatus for assembling a multiple element type electron gun structure each of the electron gun units comprising first to fifth grid electrodes arranged in succession along the path of travel of an electron beam emitted from a cathode electrode, opposing ends of the third and fifth grid electrodes having projections with a diameter smaller than the inner diameter of the fourth grid electrode which partially receives the projections. The assembling apparatus includes slotted spacers engaging the projections and other electrodes to align the various electrodes. A centre rod, various holders and means to apply a longitudinal compressive force are provided to insure accurate alignment and intimate contact of the gun elements during the bonding operation.

3,598,558

GLASS MOLD TEMPERATURE CONTROL APPARATUS

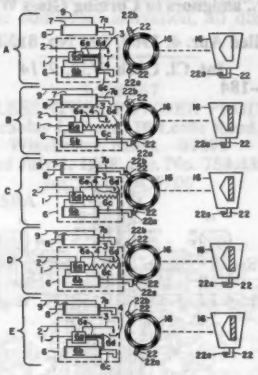
Daniel R. Ayers, Shelburne, Vt., assignor to Corning Glass Works, Corning, N.Y.

Filed June 11, 1969, Ser. No. 832,365

Int. Cl. C03b *11/12*

U.S. Cl. 65—161 **4 Claims**

Apparatus for controlling the temperature of each of a plurality of molds to within a desired temperature range therefor, each such mold being intermittently positioned at a station where a cooling fluid control valve associated with the respective mold is adjusted in accordance with a



temperature adjustment signal representing adjustment necessary in the respective valve to bring the temperature of the respectively associated mold to the desired temperature for such mold.

3,598,559

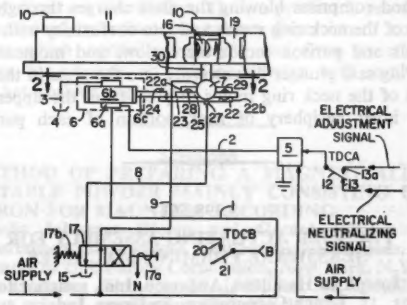
GLASS MOLDING APPARATUS WITH COOLING VALVE ACTUATING APPARATUS

Richard H. M. Johnston, and Joseph R. Jones, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 1, 1969, Ser. No. 881,232

Int. Cl. C03b *9/38*

U.S. Cl. 65—161 **4 Claims**



Apparatus for adjusting cooling fluid control valves to control the temperature of each of a plurality of molds to within a desired temperature range therefor, each such mold being intermittently positioned at a station where such a cooling fluid control valve associated with the respective mold is adjusted in accordance with a temperature adjustment signal representing adjustment necessary in the respective valve to bring the temperature of the respectively associated mold to the desired temperature for such mold.

3,598,560

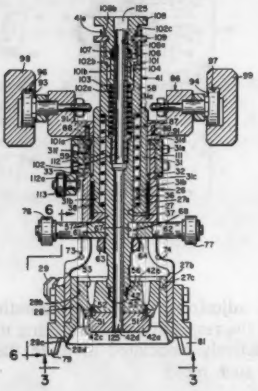
APPARATUS FOR FORMING A SHAPED NECK PORTION ON RIBBON MACHINE

Roy N. Sundstrom, Corning, and William R. Wisner, Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,534

Int. Cl. C03b 5/32, 9/14

U.S. Cl. 65—184 6 Claims



A blow-head assembly and a method of forming parisons from charges of molten glass deposited on the upper surfaces of axially separable neck ring mold assemblies and associated neck ring mold halves in an overlying relationship with the entrance to the orifices embodied in such assemblies and mold halves and extending vertically therethrough. Parison molds are disposed below the orifice of each said assembly and its associated mold halves, and said blow-head assembly comprises a combined plunger and blow-tip embodied in the bore of a hollow sleeve member and longitudinally movable therein. Forming method comprises blowing the glass charges through orifices of the neck ring molds and into conformity with such molds and parison molds therebelow, and momentarily moving said plunger downwardly into the glass in the orifices of the neck ring molds to press-form the upper rim and inner periphery of neck portion of each parison.

3,598,561

PLUNGER ACTUATING ASSEMBLY FOR GLASSWARE FORMING MACHINES

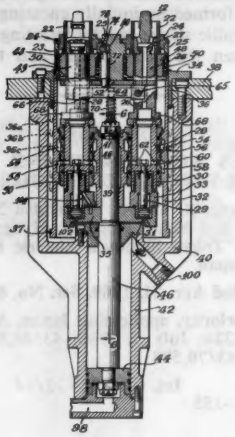
Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

Filed June 25, 1968, Ser. No. 739,759

Int. Cl. C03b 9/26

U.S. Cl. 65—233 11 Claims

An actuating assembly for a neck-forming plunger of a glassware forming machine which operates to position the plunger relative to a neck ring and a guide ring to secure vacuum settling of a glass gob in a parison mold, positive counterblow of the parison and internal cooling thereof. The assembly is particularly adapted for multiple gob glassware forming, and provides individual height adjustment for the plungers and individual control of the vacuum and counterblow operations for each plunger, and thus compensates for gob temperature variations since the degree of vacuum and the air pressure for counterblow



can be varied, all of which can be accomplished without shutdown of the machine during adjustments.

3,598,562

APPARATUS FOR TEMPERING FLAT GLASS

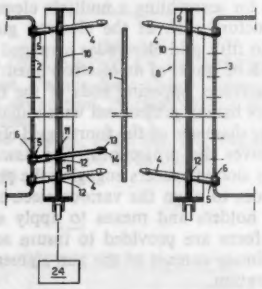
Guy Angely, Brussels, Belgium, assignor to Cobelcomex, Brussels, Belgium

Filed Jan. 8, 1968, Ser. No. 696,288

Claims priority, application Belgium, Jan. 9, 1967, 38,242; Patent 692,332

Int. Cl. C03b 27/00

U.S. Cl. 65—348 2 Claims



Apparatus for tempering flat glass having a specific number of nozzles provided on either side of the flat glass and issuing thereon cold air blasts in order to effect the tempering. Two movable frames are arranged on either side of the flat glass to be tempered, each frame carrying a specific number of blowing nozzles intermediate the length of the nozzle by means of an elastic connection. Each nozzle is connected to a plenum chamber by means of an elastic pivotal connection whereby the free end of these nozzles can decribe a curve so that the compressed cooling air strikes the glass according to a corresponding path of this curve.

3,598,563
PARTICULATE FERTILIZER AND METHOD
Wendell D. Burch, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Apr. 29, 1968, Ser. No. 725,191
Int. Cl. C05f *11/00*
U.S. Cl. 71—25 5 Claims

Water-soluble fertilizer particles of reduced hygroscopicity and nutrient release rate result from a first coating of a blend of petroleum residue and air-blown petroleum residue, a second coating of a parting agent, and a third coating of conditioning agent.

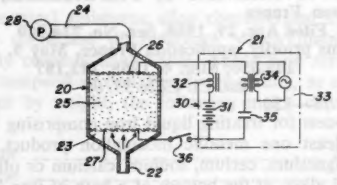
3,598,564
PLANT GROWTH REGULATING AGENTS
Ernst Jacobi, Dietrich Erdmann, Günther Mohr, Sigmund Lust, and Gerhart Schneider, Darmstadt, and Konrad Niethammer, Traisa, Germany, assignors to E. Merck A.G., Darmstadt, Germany
No Drawing. Continuation-in-part of applications Ser. No. 326,186, Nov. 26, 1963, Ser. No. 310,118, Sept. 19, 1963, Ser. No. 736,954, June 14, 1968, now Patent No. 3,506,434, and Ser. No. 508,835, Nov. 19, 1965, now Patent No. 3,476,545. This application Apr. 17, 1969, Ser. No. 817,194
Claims priority, application Germany, Sept. 22, 1962, M 54,289; Dec. 1, 1962, M 54,974; Nov. 27, 1964, M 63,287; Mar. 13, 1965, M 64,518
Int. Cl. A01n *9/24, 3/02, 21/02*
U.S. Cl. 71—76 38 Claims

For regulating plant growth, a composition comprising at least one fluorene-9-carboxylic acid ester derivative substituted by halogen in 2- and/or 7-position.

3,598,565
SEED COATING COMPOSITION
Thomas M. Graves, 4011 Roosevelt Ave., Richmond, Calif. 94805
No Drawing. Filed July 30, 1968, Ser. No. 748,617
Int. Cl. A01n *5/00;* A01c *1/06*
U.S. Cl. 71—77 9 Claims

Composition for treating seeds comprising an aqueous emulsion of a substantially water-soluble neutralized copolymer of an α,β-unsaturated monocarboxylic acid and a lower alkyl acrylate and a crosslinked copolymer of vinyl acetate and a lower alkyl acrylate. These compositions enhance the germination of the seeds.

3,598,566
POWDER ACTIVATION
Kiyoshi Inoue, 182 3-chome, Tamagawayoga-machi, Setagaya-ku, Tokyo, Japan
Filed Dec. 22, 1967, Ser. No. 692,960
Claims priority, application Japan, Apr. 26, 1967, 42/26,740, 42/26,741; June 3, 1967, 42/35,640; Dec. 1, 1967, 42/77,042
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 13 Claims



Activation of metallic powders by subjecting the powder to bombardment with electrons, ions, or molecules in an inert or reductive atmosphere. Improved densities result in sintering, as do improved catalytic actions. Simultaneous pulverization of course particles or bodies is also achieved where desired. The pretreatment is, in some instances, combined with loading the activated particles directly into a mold, for compaction or sintering, preferably with some additional activation, all done in an integrated system.

3,598,567
STAINLESS STEEL POWDER PRODUCT
Nicholas J. Grant, 10 Leslie Road, Winchester, Mass. 01890
Filed July 1, 1968, Ser. No. 750,436
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5BA 2 Claims

A method is provided for producing hot workable metal powder from compositions normally difficult or impossible to work. A molten metal bath is established of a metal composition of melting point above 1000° C. containing substantial amounts of at least one phase-forming constituent which normally forms a segregatable phase on cooling. The bath is subdivided into medium to small metal droplets and is rapidly cooled to a temperature below the freezing point at a cooling rate of at least about 100° C./sec., and preferably further rapidly cooled to or near room temperature. The powder thus produced, because of a fine dendritic grain size, is only slightly if at all segregated and all hard brittle phases are distributed as fine particles, making the alloy readily hot workable. Excess soft phases also follow the same highly dispersed distribution. Thus, a product is provided characterized by a fine near micron dispersion of excess phases which normally segregate and form as coarse phases, for example at grain boundaries, with resultant poor hot working properties.

3,598,568
METHOD OF PREPARING A MAGNETICALLY STABLE POWDER MAINLY CONSISTING OF IRON FOR MAGNETIC RECORDING
Cornelis Johannes Klomp and Gerard Willem van Oosterhout, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
No Drawing. Filed Jan. 29, 1969, Ser. No. 795,078
Claims priority, application Netherlands, Jan. 31, 1968, 6801383
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5AA 1 Claim

A method of preparing magnetically stable iron powder suitable for magnetic recording in which iron oxide hydrate, α-FeO(OH) is precipitated from a strongly reacting alkaline solution of ferrous hydroxide containing at least one compound of at least one metal selected from the group consisting of germanium, tin and aluminum in such a concentration that the atomic ratio of the latter metal to Fe in the solution is a least 0.005 while passing an oxidizing gas through the solution. The precipitate is thereafter separated from the liquid, washed, dried, and reduced in hydrogen at 250° to 500° C.

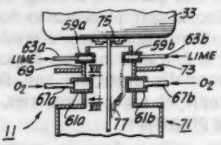
3,598,569
PELLETIZING OF IRON ORE
William R. Epperly, Berkeley Heights, N.J., assignor to Esso Research and Engineering Company
Filed Sept. 12, 1967, Ser. No. 667,111
Int. Cl. C21b 1/20
U.S. Cl. 75—3 8 Claims

Indurated iron oxide pellets are made by an improved process comprising oxidizing green pellets formed from finely divided iron oxide solids and finely divided reduced iron solids. The amount of iron oxide and reduced iron is proportioned so that oxidation of the green pellets will generate sufficient heat to sustain the oxidation and induration process.

3,598,570
STEELMAKING PROCESS
Kokichi Otani, 14–26 3-chome, Hiroo, Shibuya-ku, Tokyo, Japan
No Drawing. Continuation-in-part of application Ser. No. 658,587, Aug. 7, 1967. This application July 29, 1970, Ser. No. 59,372
Claims priority, application Japan, Aug. 12, 1966, 41/52,596; Jan. 19, 1967, 42/3,332; Jan. 20, 1967, 42/3,639; Feb. 27, 1967, 42/12,073
Int. Cl. C21c 5/00, 5/52
U.S. Cl. 75—43 9 Claims

A steelmaking process giving remarkably high production rate and high yield by the introduction into the furnace, either electric or open-hearth, of heavy oil or other readily available reducing-gas-forming material. The furnace in operation is filled with reducing flames enabling fully effective reduction and thus the blowing into the furnace of a large quantity of oxygen gas is permitted without the danger of excessive oxidation. Solid carbon material may also be added to the charge.

3,598,571
SPRAY STEELMAKING METHOD
William H. Moffatt, Lausanne, Switzerland, assignor to Koppers Company, Inc.
Filed Feb. 2, 1968, Ser. No. 702,570
Int. Cl. C21c 5/00
U.S. Cl. 75—52 5 Claims



Improved apparatus for carrying out the method of spray steelmaking includes a tundish for holding molten metal that has one or more elongate slots covered by a slidable gate to control the rate and quantity of molten metal flowing from the tundish in the form of one or more thin films of molten metal. Headers on each side of the molten film discharge oxygen and refining materials that react with the molten metal to produce steel.

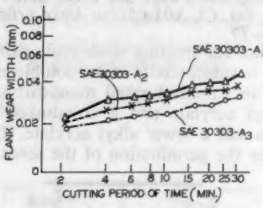
3,598,572
METHOD OF TREATING MOLTEN FERROUS METALS AND MATERIALS FOR USE IN SUCH TREATMENT
John Clifton Robertson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 22, 1968, Ser. No. 778,322
Int. Cl. C21c 1/10, 7/00
U.S. Cl. 75—53 10 Claims

The present invention is a method of introducing relatively low boiling metals into molten ferrous metals which comprises adsorbing the vapor of the low boiling metal on activated charcoal and introducing the metal-activated charcoal additive into the ferrous metal melt. The invention also involves the metal-activated charcoal additive and method of its preparation.

3,598,573
DESULFURIZATION AGENT AND PROCESS
Alfred Freissmuth, Trostberg, Walter Heinl, Garching, and Herbert Knahl and Erich Pfluger, Trostberg, Germany, and Jan Schokkenbroek, Alkmaar, Netherlands, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Germany
No Drawing. Filed Apr. 28, 1969, Ser. No. 819,997
Claims priority, application Germany, Apr. 29, 1968, P 17 58 250.2
Int. Cl. C21c 1/02
U.S. Cl. 75—55 4 Claims

A mixture of calcium carbide and precipitated, carbon-containing calcium carbonate is most effective in desulfurizing ferrous melts.

3,598,574
FREE CUTTING STAINLESS STEELS
Tetsuro Ito, Nagoya, and Goshi Kato, Tsushima, Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Aichi Prefecture, Japan
Filed Nov. 5, 1968, Ser. No. 773,404
Claims priority, application Japan, Mar. 8, 1968, 43/14,630
Int. Cl. C22c 39/20
U.S. Cl. 75—128R 5 Claims



A free cutting stainless steel having a chromium-nickel or chromium-nickel manganese base, and having from 0.01–0.06% by weight of calcium therein as the free cutting element.

3,598,575
PROCESS FOR TREATING CAST IRON
Henri Jarysta, Pont-a-Mousson, France, assignor to Centre de Recherches de Pont-a-Mousson, Pont-a-Mousson, France
Filed Apr. 29, 1968, Ser. No. 724,960
Claims priority, application France, May 9, 1967, 105,658; Mar. 4, 1968, 142,187
Int. Cl. C22c 33/00
U.S. Cl. 75—130 9 Claims

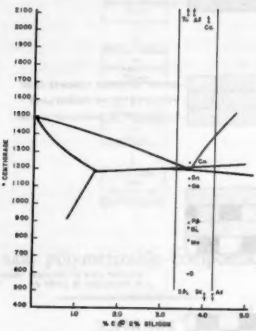
A process for treating liquid iron comprising introducing at least one metallic inoculation product, such as pure magnesium, cerium, sodium, calcium or other metal or metal alloy, at the bottom of a bath of iron by means of an immersed bell, wherein said metallic inoculating product is introduced into the bath of iron in the form of at least one piece of said product totally covered with a coating of a refractory material, a part of the coating being thinner than the rest of the coating.

3,598,576

METHOD OF MAKING NODULAR IRON

William H. Moore, Purchase, N.Y., and Harry H. Kessler, Clayton, Mo., assignors to Meehanite Metal Corporation

Filed Aug. 13, 1968, Ser. No. 752,249
Int. Cl. C22c *37/04, 37/10*
U.S. Cl. 75—130 3 Claims



Improving the graphite nodule count and reducing the degenerate graphite shape in the process of making nodular cast iron by adding germanium, lead, salts of the two materials or combinations of all, so that the amount of lead or germanium or combinations thereof falls in the range of .002% or 0.2% based on the weight of iron.

3,598,577

ALUMINUM BASE ALLOY

Edward E. Stonebrook, Cleveland, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

No Drawing. Filed Aug. 23, 1967, Ser. No. 662,584
Int. Cl. C22c *21/00*
U.S. Cl. 75—141 5 Claims

An aluminum base alloy, suitable for casting useful articles containing aluminum and 3 to 6% copper, 2 to 5% zinc, 0.2 to 1.5% magnesium, 0.2 to 0.6% manganese, and grain refining additions, exhibits, when solution heat treated, quenched and artificially aged, high room and elevated temperature strength which may be coupled with substantial immunity to stress corrosion cracking.

3,598,578

ELECTRICAL RESISTANCE ALLOY AND METHOD OF PRODUCING SAME

Teh Po Wang, Cedar Grove, N.J., assignor to Wilbur B. Driver Company

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,594
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 5 Claims

An electrical resistance alloy characterized by a temperature coefficient of resistance which maintains an essentially constant fixed value approaching zero over a selected temperature range and comprising, as expressed in percent by weight, the following major constituents:

	Percent
Aluminum	2.75–3.75
Manganese	4.0–5.5
Silicon	0.70–1.25
Chromium	17.5–22.5
Nickel	Balance

To this is added as a minor constituent at least one deoxidizer selected from the class consisting of zirconium, calcium and magnesium in an amount up to 0.1%. The alloy is produced by a process in which it is strand annealed, rapid cooled, heat treated and slow cooled.

3,598,579

METHOD OF TRANSFERRING ELECTROSTATIC IMAGES TO A DIELECTRIC SHEET WHEREIN A REVERSAL OF POTENTIAL IS USED TO CLEAR BACKGROUND AREAS

Gene H. Robinson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 6, 1967, Ser. No. 665,911
Int. Cl. G03c *15/18, 13/18*
U.S. Cl. 96—1 7 Claims

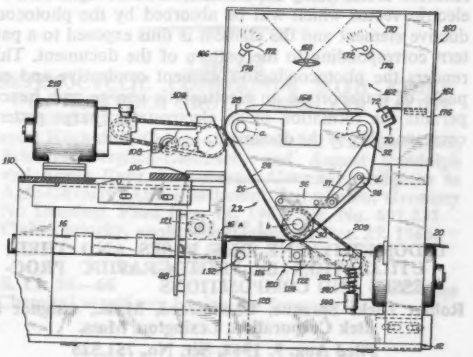
The background density of a toned electrostatic image pattern produced on a receiver sheet is reduced by placing a receiver sheet comprising an insulating coating on a conductive layer, in face-to-face contact with a photoconductive element; exposing the element to a pattern of actinic radiation while an electrical potential is applied between the receiver and photo-conductive element; and momentarily reversing the polarity of the applied potential upon termination of the exposure. If the potential of the reversed polarity is properly selected, an electrostatic image will be produced having one polarity and a background having the opposite polarity. Also, either a positive or negative polarity can be used at the start of the procedure so that positive prints can be made from either a negative or positive original.

3,598,580

PHOTOELECTROSTATIC COPYING PROCESS EMPLOYING ORGANIC PHOTOCONDUCTORS

Evan S. Baltazzi, Brookfield, Loren E. Shelffo, Palatine, and Michael Moduthagam, Chicago, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Oct. 16, 1967, Ser. No. 675,463
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.4 8 Claims



A photoelectrostatic copying apparatus equipped with a reusable continuous belt coated with an organic photoconductive medium adapted to move in an orbital path. A series of processing stations are located adjacent the path of movement of the belt so that, in sequence, it moves past charging, exposing, developing and transfer stations producing a copy or multiple copies on plain paper. The organic photoconductive medium is reusable. It is ready

immediately after a developed image is transferred to the copy sheet to receive a new image without preliminary mechanical or electrical cleaning of the photoconductive medium.

3,598,581

MANIFOLD IMAGING METHOD

Gedeminas J. Reinis, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Apr. 3, 1967, Ser. No. 628,028
Int. Cl. G03g 5/00, 13/00
U.S. Cl. 96—1.5 **7 Claims**

An imaging system using a manifold set including a solid layer which may be activated by heat is described. The set typically consists of a donor sheet, a cohesively weak photosensitive layer, a low melting layer and a receiving sheet. The set is heated above the melting temperature of the low melting layer, an electrostatic latent image is formed in the photosensitive layer and the sheets are separated, forming positive and negative images on the two sheets conforming to the latent image.

3,598,582

PHOTOCONDUCTIVE ELEMENT EXHIBITING PHOTOCONDUCTIVE DICHROISM AND PROCESS OF USING SAME

Clifford E. Herrick, Jr., Los Gatos, and Meredith David Shattuck, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Sept. 18, 1967, Ser. No. 668,697
Int. Cl. G03g 5/08, 13/22
U.S. Cl. 96—1.5 **24 Claims**

An electrophotographic process for the production of reflex copies in which a document is positioned adjacent a photoconductive element which exhibits photoconductive dichroism and has a preferred absorption axis, and in which the photoconductive element is uniformly exposed through the photoconductive element with polarized light whose vector, relative to the absorption axis, is such that the light is not absorbed. The polarized light in striking the document is absorbed in some areas, normally the dark image areas, and depolarized and reflected in others, normally the light background areas. The light from the reflected areas, being depolarized, contains light with an electric vector which will be absorbed by the photoconductive element and the element is thus exposed to a pattern corresponding to the pattern of the document. This renders the photoconductive element conductive and capable of transporting an electrostatic charge and, hence, permits the formation of an electrostatic charge pattern corresponding to the document.

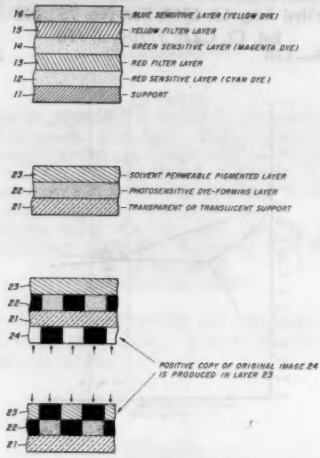
3,598,583

INDOMETHYLENE DYE BASES AND THEIR UTILIZATION IN PHOTOGRAPHIC PROCESSES AND COMPOSITIONS

Robert Hicks Sprague, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 9, 1968, Ser. No. 751,525
Int. Cl. G03c 7/00, 5/54, 7/36
U.S. Cl. 96—3 **21 Claims**

Indomethylene dye bases containing one or more substituted or unsubstituted indole nuclei including one or more olefinic unsaturations in the five-membered ring, i.e. dye bases containing indolinyl, indoleninyl, and/or indolyl radicals; photosensitive compositions comprising such an indomethylene dye base and a free radical generating organic halogen compound; imaging media having one or more photosensitive layers incorporating a photosensitive composition therein; direct print-out processes employing photosensitive compositions and imaging media for producing photographic images.

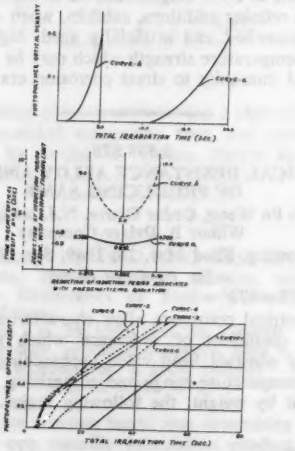


3,598,584

PHOTOPOLYMERIZATION PHOTOGRAPHY-REDUCTION OF INDUCTION PERIOD AND PRODUCT

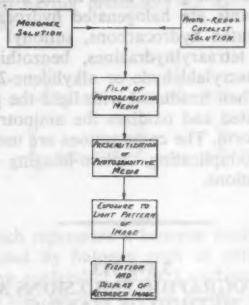
John B. Rust, Los Angeles, and Leroy J. Miller, Canoga Park, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 3, 1966, Ser. No. 583,652
Int. Cl. G03c 1/68, 5/00; G03f 7/10
U.S. Cl. 96—35.1 **5 Claims**



A method for presensitizing a polymerizable photosensitive composition containing a photosensitive polymerization initiator capable of initiating mass polymerization of said photosensitive composition when irradiated with radiant energy, consisting of the step of uniformly irradiating said photosensitive composition with radiant en-

ergy and activating said catalyst for a time no longer than the induction period associated with visible mass polymerization of said polymerizable composition by said radiant energy.


Monomer Solution
Photo-Redox Catalyst Solution
Film of Photosensitive Media
Photosolubilization of Photosensitive Media
Exposure to Light Pattern or Image
Fixation and Display of Reproduced Image

3,598,585

AZIDO PHOTOHARDENABLE COLLOID CONTAINING AN IMMOBILE DYE AND PROCESS OF USING

Bela Gaspar, 240 S. Oakhurst Drive, Beverly Hills, Calif. 90212

No Drawing. Filed July 26, 1967, Ser. No. 655,998
Int. Cl. G03c *1/60, 1/52, 5/18*
U.S. Cl. 96—36 12 Claims

A light sensitive material containing a hardenable hydrophilic colloid, e.g., a gelatin, layer which contains a light sensitive aromatic azide and a coloring substance in the form of an immobile coloring matter or dye, or precursor capable of being transformed into an immobile coloring matter or dye by suitable treatment, such coloring substance being in homogeneous molecularly dispersed form in the colloid, said light sensitive material being substantially transparent and substantially free of opacity and light scattering characteristics and procedure for utilizing such material, which includes the steps of exposing said colloid layer to light under a pattern or negative, causing said azide to harden the colloid in proportion to the degree of exposure, and removing the unhardened colloid by dissolution with water, producing a dyed relief image which can be either a half-tone or a continuous-tone image.

3,598,586

AROMATIC AZIDE MATERIAL AND PROCESS FOR PRODUCING COLOR IMAGES

Bela Gaspar, 240 S. Oakhurst Drive, Beverly Hills, Calif. 90212

No Drawing. Filed July 26, 1967, Ser. No. 656,020
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.3 20 Claims

A light sensitive material containing a hardenable hydrophilic colloid, e.g., gelatin, layer which contains a light sensitive aromatic azide and a transferable dye, and procedure for utilizing such material, which includes the steps of exposing said colloid layer to light under a pattern or negative, to harden the colloid in proportion to the degree of exposure, temporarily immobilizing the transferable dye, e.g., by lowering the pH of the colloid layer, or by salt formation, and removing the unhardened colloid by dissolution with water, thereby producing a dyed matrix without the loss of dye density of said transferable dye during the operation which removes the unhardened colloid, the immobilized dye being rendered transferable to a receiving layer or blank, e.g., by contacting the hardened relief image with such receiving layer at a higher pH such as an alkaline pH, e.g., about 8.

3,598,587

PHOTOGRAPHIC PHYSICAL DEVELOPERS

Joseph S. Yudelson and Barbara F. Dernbach, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 22, 1968, Ser. No. 723,269
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 21 Claims

A novel physical developer for palladium latent images comprises a reducible heavy metal salt, a complexing agent for the heavy metal ions, a reducing agent for the heavy metal ions and a carboxylic acid complexing agent having a high degree of specificity towards palladium ions.

3,598,588

PROCESSING SOLUTION FOR SILVER HALIDE PHOTOGRAPHIC MATERIAL AFTER FIXATION PROCESS

Heinz Meckl, Cologne-Flittard, and Helmut Haseler, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 20, 1968, Ser. No. 706,767
Claims priority, application Germany, Mar. 8, 1967, A 55,088
Int. Cl. G03c *5/26, 5/38*
U.S. Cl. 96—50 5 Claims

Harmful effect of residual thiosulfate in processed photographs is reduced by a final rinse in aqueous solution of compound having monochloro- or monobromo-substituted carbon and also having an aldehyde, carboxyl or sulfo group, the chlorine or bromine of which reacts with the thiosulfate. Solution can have pH of 4 to 8.

3,598,589

SILVER DYE BLEACH REPRODUCTION SYSTEM

John Morgan, Ruislip, England, assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 11, 1968, Ser. No. 711,867
Claims priority, application Great Britain, Sept. 20, 1967, 42,750/67
Int. Cl. G03c *1/40, 7/00*
U.S. Cl. 96—53 9 Claims

A process for reproducing images which comprises forming an imagewise distribution of catalyst in a master sheet and contacting the catalyst bearing side of the master sheet with a dye-bearing receiving sheet in the presence of silver and a silver dye bleach to imagewise bleach the dye in the areas of contact with the catalyst.

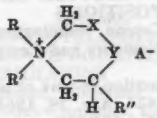
3,598,590

HETEROCYCLIC COMPOUNDS WITH ETHER OR THIOETHER GROUPS AS SILVER HALIDE SENSITIZERS

Harald Hückstadt, Cologne, Stammheim, Wilhelm Saleck, Schildgen-Bergisch-Gladbach, and August Randolph and Erwin Ranz, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,231
Claims priority, application Germany, Dec. 27, 1966, A 54,478
Int. Cl. G03c *1/28, 5/30*
U.S. Cl. 96—66 14 Claims

Chemical sensitizers having the formula



wherein:

R and R′ are alkyl with up to 18 carbon atoms, or together represent the ring members necessary for completing a 5-, 6- or 7-membered heterocyclic ring,

X is oxygen or sulfur; Y is a chemical bond or a methylene group;

R'' is hydrogen, hydroxyl, esterified hydroxyl, the group $-CH_2-S-Z$ in which Z represents acyl, an aminomethyl group, aryl, aralkyl,

A is any anion

increase the sensitivity of photographic silver halide emulsions when incorporated in the emulsions or in the developers used to develop the emulsions after exposure. When used in color-forming developers with multi-layer emulsions in which a red-sensitive emulsion is covered by a green-sensitive emulsion which in turn is covered by a blue-sensitive emulsion, the lowermost emulsion has its sensitivity increased more than the middle one and the uppermost emulsion has its sensitivity increased less than the middle one or actually decreased. The foregoing chemical sensitizers can be used with other chemical sensitizers.

3,598,591

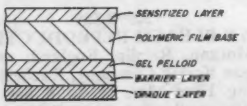
PHOTOGRAPHIC ELEMENT CONTAINING READILY REMOVABLE OPAQUE PROTECTIVE LAYERS

John F. Bishop, Webster, and Walker F. Hunter, Jr., and Martin E. Rowley, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 645,032, June 9, 1967. This application Oct. 28, 1968, Ser. No. 788,109

Int. Cl. G03c *1/84*

U.S. Cl. 96—84 **8 Claims**



Readily removable opaque coatings over one or both sides of a photographic or radiographic film, which coatings can be removed in a single piece, can be manufactured by applying over the film a multilayer coating composition comprising

(a) a first "barrier" layer containing one or more water soluble polymers that are compatible with gelatin and that adhere tenaciously to the "opaque" layer (b) and

(b) an "opaque" layer (over the "barrier layer") composed of a blend of finely divided carbon and at least one water-insoluble polymer.

The "opaque" layer must be fairly permeable to water, so that when it is desired to remove the "opaque" coating, the film can simply be immersed in water. Within a very short time the "opaque" layer falls away from the film in a single piece, rather than in small troublesome flakes.

3,598,592

STORAGE-STABLE PHOTOSENSITIVE AMINOTRIARYLMETHANE/SELECTED ORGANIC PHOTOOXIDANT COMPOSITIONS

Lawrence Anthony Cescon, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 363,624, Apr. 29, 1964. This application Nov. 7, 1967, Ser. No. 681,118

Int. Cl. G03c *1/00, 1/76*

U.S. Cl. 96—85 **12 Claims**

Storage-stable light-sensitive compositions comprising an aminotriarylmethane or salt thereof and a selected photooxidant. The aminotriarylmethane contains at least two phenyl groups having a disubstituted amino group para to the methane carbon and an alkyl, alkoxy, halo or butadienylene group ortho to the methane carbon. The photooxidants are halogenated hydrocarbons, halogenated substituted hydrocarbons, sulfonyl halides, sulfenyl halides, tetraarylhydrazines, benzothiazolyl disulfides, polymethacrylaldehyde or alkylidene-2,5-cyclo-hexadien-1-one. When irradiated with light the photooxidant becomes activated and oxidizes the aminotriarylmethane to its colored form. The compositions are useful in photocopying, photoduplicating, micro-imaging and photographic applications.

3,598,593

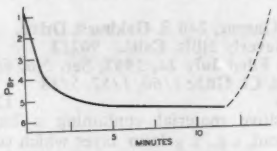
PHOTOGRAPHIC EMULSIONS AND METHOD OF MAKING

Guenther Harald Klinger, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 21, 1965, Ser. No. 515,391

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 **8 Claims**



Preparation of gelatin-silver bromide photographic emulsions, involving precipitation of the silver bromide by admixture of aqueous solutions of a water soluble silver salt and a water soluble bromide, wherein the pBr is maintained above 5 during formation of the major portion of the silver bromide, whereby the average particle size of the silver bromide forming is above 0.8 micron, and finally adding excess bromide solution at the end of the silver bromide formation.

3,598,594

PHOTOGRAPHIC MATERIAL FOR THE SILVER DYE BLEACHING PROCESS

Karl-Heinz Freytag, Leverkusen, Karlheinz Kabitzke, Cologne-Buchheim, Eric Bockly, Leverkusen, and Justus Danhauser, Cologne-Stammheim, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

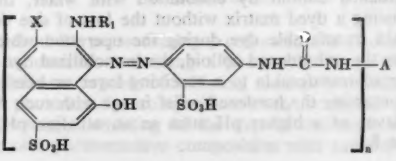
No Drawing. Filed June 18, 1968, Ser. No. 737,815

Claims priority, application Germany, June 27, 1967, A 56,095

Int. Cl. G03c *1/10*

U.S. Cl. 96—99 **4 Claims**

Certain sulfonated amino naphthol azo benzene dyes are particularly diffusion-fast, brilliant and light-fast magenta dyes for silver-dye-bleach photographic use. A dye having these properties is an azo silver dye bleach dye of the following formula:

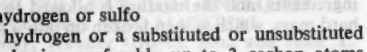


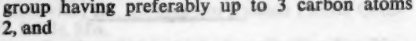
in which

X represents hydrogen or sulfo

R_1 stands for hydrogen or a substituted or unsubstituted alkyl group having preferably up to 3 carbon atoms

n is 1 or 2, and

Y is 

Z is 

and

R_2 and R_3 each represents a benzene nucleus which may be substituted by halogen such as chloride bromide, alkyl having preferably up to 3 carbon atoms, alkoxy with preferably up to 3 carbon atoms or halogen substituted alkyl having preferably up to 3 carbon atoms in particular chloro or fluoro substituted alkyl;

R_4 represents a substituted or unsubstituted alkyl having preferably up to 5 carbon atoms or R_2.

3,598,595

SILVER HALIDE EMULSIONS SENSITIZED WITH CYANINE DYES CONTAINING A PYRROLO[2,3-b] QUINOXALINE OR PYRROLO[2,3-b]PYRAZINE NUCLEUS

John D. Mee, Donald W. Heseltine, and Wilbur S. Gaugh, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 15, 1968, Ser. No. 705,595
Int. Cl. G03c *1/08, 1/10, 1/28*
U.S. Cl. 96—120 30 Claims

Novel cyanine dyes are provided which feature a pyrrolo[2,3-b]quinoxaline nucleus or a pyrrolo[2,3-b]pyrazine nucleus, joined at the 3-carbon atom thereof to the methine linkage of the cyanine dye. Photographic silver halide emulsions containing these dyes are also provided.

3,598,596

DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING SENSITIZING DYE WITH A 1,2-DIARYL SUBSTITUTED INDOLE NUCLEUS

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 22, 1968, Ser. No. 746,259
Int. Cl. G03c *1/10, 1/34, 1/28*
U.S. Cl. 96—120 26 Claims

Novel cyanine dyes are provided which features a 1,2-diarylindole nucleus. Light sensitive silver halide emulsions containing these dyes are also provided.

3,598,597

SPEED AND CONTRAST OF A SILVER HALIDE PHOTOGRAPHIC EMULSION OBTAINED BY ADDITION OF SILVER CHLORIDE EMULSION TO SILVER BROMIDE EMULSION

Francis J. Farren and Francis J. Avery, Vestal, N.Y., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed May 24, 1967, Ser. No. 640,807
Int. Cl. G03c *1/28*
U.S. Cl. 96—108 7 Claims

The subject invention relates to photographic silver halide emulsions formed by the incorporation of a fine grain silver chloride emulsion in an ammoniacal silver bromo-iodide emulsion.

3,598,598

FOG STABILIZERS FOR PHOTOGRAPHIC EMULSIONS

Arthur H. Herz, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,332
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 20 Claims

A photographic silver halide emulsion or photographic element containing a fog-stabilizing amount of a thionamide, e.g., a 3-substituted thiazoline-2-thione, N,N-disubstituted dithiocarbamic ester or an N,N,N',N'-tetrasubstituted thiourea, which contains at least one acid group in the molecule is disclosed. The acid group or groups contained in the thionamide molecule should be ones which will confer a negative charge to the thione at a pH of 5 or below and is exemplified by carboxylic or sulfonic acid groups. Silver halide complexes of thionamides and developing photographic elements are also described.

3,598,599

POLYMERIC THIAZOLE FOG STABILIZERS FOR PHOTOGRAPHIC EMULSIONS

Richard C. Tuites and Louis M. Minsk, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 9, 1967, Ser. No. 673,922
Int. Cl. G03c *1/34, 1/72*
U.S. Cl. 96—109 19 Claims

Polymeric thiazoles containing thiazole groups either incorporated into the polymer chain or appended to the polymer backbone and photographic silver halide emulsions or photographic elements containing fog-stabilizing amounts of such polymeric thiazoles.

3,598,600

PHOTOGRAPHIC COMPOSITIONS AND ELEMENTS CONTAINING POLYMERIC IMIDAZOLES

Richard C. Tuites and Louis M. Minsk, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 9, 1967, Ser. No. 673,933
Int. Cl. G03c *1/34, 1/72*
U.S. Cl. 96—109 12 Claims

Novel polymers containing imidazole groups attached to the polymer backbone through an amide or an ester linkage are disclosed. Use in a photographic silver halide emulsion and a photographic element of a polymer containing imidazole groups attached thereto is also described.

3,598,601

ALKYL ESTERS OR ORGANIC ACIDS, SUCH AS STEARYL MALATE, AS ANTIFOGGANTS

Dorothy J. Beavers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 17, 1969, Ser. No. 858,853
Int. Cl. G03c *1/34, 5/30*
U.S. Cl. 96—109 13 Claims

Alkyl esters of organic acids, such as stearyl malate, are used as a stabilizer and fog inhibitor for photographic silver halide.

3,598,602

s-TRIAZOLO[4,3-b]-s-TRIAZOLES AND DERIVATIVES AS ANTIFOGGANTS FOR PHOTOGRAPHIC EMULSIONS

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,529
Int. Cl. C07d *107/04;* G03c *1/34*
U.S. Cl. 96—109 14 Claims

7H-s-triazolo[4,3-b]-s-triazole and 5H-s-triazolo-[4,3-b]-s-triazole and their derivatives are used with photo-

graphic silver halide elements an emulsions in order to stabilize said elements and emulsions against fog.

3,598,603

SILVER HALIDE EMULSIONS WITH CYANINE DYES CONTAINING A 1-CYCLOHEXYL SUBSTITUTED PYROLE NUCLEUS

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,904
Int. Cl. G03c *1/08*; C09b *23/10*
U.S. Cl. 96—130 23 Claims

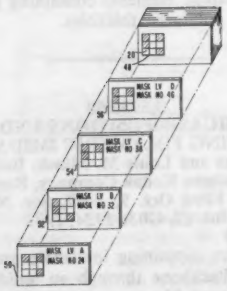
Novel cyanine dyes which feature a 1-cyclohexyl substituted pyrole nucleus linked, by the 2- or 3-carbon atom thereof, to the methine chain of the dye, are useful sensitizers in photographic silver halide emulsions.

3,598,604

PROCESS OF PRODUCING AN ARRAY OF INTEGRATED CIRCUITS ON SEMICONDUCTOR SUBSTRATE

Arthur H. De Puy, Essex Center, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1968, Ser. No. 777,011
Int. Cl. G03c *5/04*
U.S. Cl. 96—36.2 8 Claims



Yield in semiconductor manufacturing processes wherein a plurality of masks are used for different processing steps to expose photoresist in arrays of patterns for semiconductor circuits on a wafer may be maximized by overlaying defects in the masks. This may be done by combining one mask for each processing step in various combinations, then selecting the combination for use which will minimize the number of defective integrated circuits in the array.

3,598,605

FOOD FOR FUR-BEARING PREDATORY ANIMALS

Claus Lutherus van Limborgh, Baarn, Netherlands, assignor to Stichting voor Wetenschappelijk Onderzoek op Diervoedergebied, Putten, Netherlands

No Drawing. Filed Mar. 10, 1967, Ser. No. 622,051
Claims priority, application Netherlands, Mar. 18, 1966, 6603625; Feb. 27, 1967, 6703019
Int. Cl. A23k *1/00, 1/10*
U.S. Cl. 99—2 3 Claims

A dry food for Mustelidae, such as mink, and other predatory animals, containing all required nutrients is mixed with water before consumption. The consistency of the watered food is such that the animals are prevented from soiling their pelts. Molten fat is mixed with the other ingredients, and the mixture is allowed to congeal into a hard mass, which is then broken up into a granulate.

3,598,606

PREPARATION OF FISH PROTEIN CONCENTRATE AND FISH MEAL

John Spinelli, Seattle, Wash., assignor to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,117
Int. Cl. A23k *1/10*
U.S. Cl. 99—7 13 Claims

Raw, ground, whole or deboned, fish is contacted with an acidic aqueous solution of a condensed inorganic phosphate, e.g., sodium hexametaphosphate, to insolubilize the protein fractions of the tissue components. The insolubilized protein may then be water washed to remove oil and other undesired tissue components. Either fish meal, suitable for animal feed, fertilizer, etc., or high protein concentrate, suitable for human food use, is recovered.

3,598,607

METHOD OF MAKING WINE FROM HONEY

Roger A. Morse, Ithaca, and Keith H. Steinkraus, Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

No Drawing. Continuation of application Ser. No. 657,491, Aug. 1, 1967. This application Apr. 1, 1970, Ser. No. 22,129
Int. Cl. C12g *1/00*
U.S. Cl. 99—35 6 Claims

A natural process method of making a 12 to 14 percent alcohol beverage from honey, characterized by the addition of additives to a 20 to 24 percent honey solution to reduce the fermentation time to about two weeks, use being made of yeast strain 618 (Rahn collection), and an incubation temperature of 15° to 18° C.

3,598,608

CONCENTRATION OF TEA

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Scientific and International Corporation

Filed July 6, 1967, Ser. No. 651,615
Claims priority, application Great Britain, July 15, 1966, 31,830/66
Int. Cl. A23f *3/00*
U.S. Cl. 99—77 6 Claims

In the freeze concentration of tea, the tea solution is cooled to near freezing to precipitate "cream" of tea, the tea solution is freeze concentrated, the precipitate is dissolved in a small amount of hot water, the dissolved precipitate is mixed with the freeze concentrated tea solution, and the mixture is freeze dried.

3,598,609

SOFT DRINK CONCENTRATE

Peter X. Hoynak, Fort Lee, N.J., assignor to CPC International Inc.

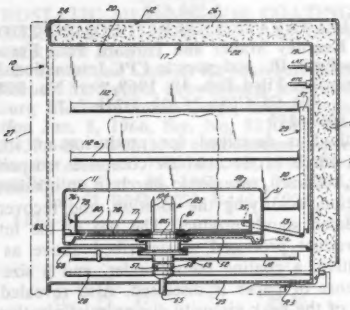
Filed Jan. 22, 1968, Ser. No. 699,468
Int. Cl. A23l *1/00*; C13k *1/06*
U.S. Cl. 99—78 7 Claims

An acidic liquid concentrate containing a flavoring agent and as a sweetening agent, 30 to 70% by weight sucrose dissolved in a 25 DE starch hydrolysate syrup. The syrup contains 70 to 30% by weight dextrose. A unit portion of the liquid concentrate is packaged within a plastic pouch or tetrahedronal container.

3,598,610
TREATING FULL-FAT, HULL ENCLOSED COTYLEDON SEED MATERIAL
Robert L. Hawley, Webster Groves, Mo., and Jesse T. Duren, Belleville, Ill., assignors to Ralston Purina Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 724,326, Apr. 26, 1968, which is a continuation-in-part of abandoned application Ser. No. 637,910, May 12, 1967. This application July 18, 1969, Ser. No. 843,209
Int. Cl. A23l *1/20*
U.S. Cl. 99—98 14 Claims

A method of making full-fat flour products from hull enclosed cotyledons, especially pea or bean legumes, particularly soybeans, utilizing a novel sequence of steps to dehull and also to alter the texture and cell structure in a manner causing the treatment steps to remove objectionable flavor constituents, to remove or alter physiologically objectionable sugar constituents, and basically to produce a full-fat edible flour product retaining the desirable oils, by the use of a special combination of controlled dry heating of the complete bean externally and internally, to alter the internal and external chemical and physical characteristics thereof, followed by controlled water treatment to further alter the heat altered structure by swelling and extraction processes. This is followed by either (a) drying the treated cotyledons and grinding to a powder, or (b) grinding the treated cotyledons, slurrying with water, and flash drying to a powder, or (c) grinding the treated cotyledons, forming into a desired shape and roasting.

3,598,611
METHOD OF INHIBITING SMOKE AND CONTAINING SPATTER OF COOKING MEAT
Myron, Swetlitz, Omaha, Nebr., assignor to Borg-Warner Corporation, Chicago, Ill.
Original application May 25, 1966, Ser. No. 552,948, now Patent No. 3,503,323, Mar. 31, 1970. Divided and this application July 25, 1969, Ser. No. 871,226
Int. Cl. A22c *18/10;* A23l *1/00*
U.S. Cl. 99—107 8 Claims



A method for cooking food which inhibits smoke and prevents spatter from reaching and soiling the cooking apparatus. The food is supported in a receptacle and positioned relative to a heater while being rotated at 30 to 300 revolutions per minute about a substantially vertical axis. The food is heated to exude the food juices therefrom due to centrifugal force established by rotation of the food. The juices then flow downwardly into the receptacle and through a porous member to the bottom of the receptacle which is heat shielded to prevent overheating of the juices.

3,598,612
METHOD OF IMPROVING COLOR OF COOKED EGG PRODUCTS
Wesu Ng, St. Louis, Mo., assignor to The Ralston Purina Company, St. Louis, Mo.
No Drawing. Filed Dec. 19, 1968, Ser. No. 785,354
Int. Cl. A23l *1/32*
U.S. Cl. 99—113 11 Claims

A method for producing cooked egg products which comprise treating egg yolks with minor amounts of an edible oxidizing agent and subsequently formulating said yolk into a finished cooked egg product wherein the yolk is surrounded by coagulated egg whites. The particular treatment of the egg yolk substantially eliminates or substantially reduces the characteristic gray or green discoloration which is customarily present at the yolk-white interface of cooked egg products.

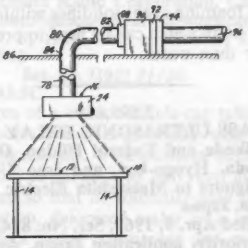
3,598,613
PROCESS FOR MANUFACTURING COOKED EGG YOLK PRODUCTS
Robert L. Hawley, St. Louis, Mo., assignor to The Ralston Purina Company, St. Louis, Mo.
No Drawing. Filed Dec. 19, 1968, Ser. No. 785,362
Int. Cl. A23l *1/32*
U.S. Cl. 99—113 16 Claims

A method for producing cooked egg yolk products which comprises heating and coagulating raw yolks, grinding or milling the coagulated yolks, forming said yolks into a desired shape and subsequently heating the resulting shaped yolks to form a solid, coagulated egg yolk product.

3,598,614
THICKENED EDIBLE SOY SAUCE AND METHOD FOR THE PREPARATION THEREOF
Edward J. Hsu, 2065–D Orchard St., Urbana, Ill. 61801
No Drawing. Filed May 29, 1968, Ser. No. 732,825
Int. Cl. A23l *1/22*
U.S. Cl. 99—145 7 Claims

A novel thickened soy sauce is prepared by heating liquid soy sauce, adjusted in pH to about 4.5–5, with mixed gelatin and agar or with mixed glutinous rice starch and tapioca starch, the preparation with starches also involving a sequence of controlled cooling steps. The thickened sauce so prepared is highly stable and is adapted to be spread over or otherwise applied to food stuffs.

3,598,615
PROCESS FOR TREATING MEAT
Charles A. Chamberlain, Tacoma, Wash. (P.O. Box 337, Milton, Wash. 98354)
Continuation-in-part of application Ser. No. 501,890, Oct. 22, 1965. This application June 12, 1968, Ser. No. 736,496
Int. Cl. A22c *18/00*
U.S. Cl. 99—194 3 Claims



This invention is for a meat cutting table and process which maintains the meat at a below freezing temperature and allows the workers, cutting and wrapping the meat, to be at a temperature above freezing temperature.

3,598,616
COATING COMPOSITION WITH ORGANIC BASE AND HEXAVALENT Cr
Geoffrey Moorehouse Gibson, Moortown, Leeds, and Clifford Alfred Vessey, Harrogate, England, assignors to Albright & Wilson Limited, Birmingham, England
No Drawing. Continuation-in-part of application Ser. No. 580,166, Sept. 19, 1966. This application Sept. 18, 1968, Ser. No. 774,559
Claims priority, application Great Britain, Sept. 21, 1965, 40,228/65
Int. Cl. C09d 5/08
U.S. Cl. 106—14 23 Claims

A paint composition having improved anti-corrosive properties is provided by admixing with the film-forming vehicle at least one hexavalent chromium salt of calcium, strontium, barium or zinc in a defined amount and a defined proportion an organic nitrogenous base or salt thereof.

3,598,617
FLAME-PROOF COATING COMPOSITION
Lawrence G. Bockstie, Jr., Bradford, Pa. assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Apr. 25, 1968, Ser. No. 724,271
Int. Cl. C09k 3/28
U.S. Cl. 106—15FP 12 Claims

A coating composition comprising (a) an at least partially hydrolyzed tetraalkyl orthosilicate, (b) aluminum oxide, (c) titanium dioxide, (d) silicon dioxide, and (e) a suspension agent, wherein said titanium dioxide and said suspension agent are added to the composition as dry particles having agglomerates greater than about 1 micron in size, and wherein the alkali metal content of said coating composition is such that, upon curing, a coating prepared from said composition contains (f) less than about 0.05% Na, (g) less than about 0.05 K, (h) less than about 0.01% Li, (i) less than about 0.001% Cs, and (j) less than about 0.001% Rb, all percentages being in terms of the oxides of the respective alkali metals.

3,598,618
MAGNESIA BEARING POROUS GRAINS AND BODIES
Kinjiro Fujii, Yoshihiko Ishido, and Akihiro Motoe, Tokyo, Japan, assignors to Agency of Industrial Science & Technology Ministry of International Trade and Industry, Tokyo, Japan
No Drawing. Continuation-in-part of abandoned application Ser. No. 688,316, Dec. 6, 1967. This application Feb. 8, 1968, Ser. No. 703,896
Int. Cl. C04b 33/00
U.S. Cl. 106—40 5 Claims

A small amount of strong acetic acid reacts with magnesia or magnesium hydroxide to form stronly coherent porous grains or pellets which, after being moistened with a small amount of water, can be shaped with or without addition of refractory fillers and fired into porous magnesia bodies. A slurry prepared from magnesia or magnesium hydroxide, acetic acid, a small amount of water and chemical foaming agent solidifies within a few minutes into a porous body which can be fired to produce magnesia bricks lighter than water.

3,598,619
GLASS ULTRASONIC DELAY LINE
Masanari Mikoda and Tadashi Hikino, Osaka-fu, Takayuki Kuroda, Hyogo-ken, and Isao Ueno, Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 9, 1969, Ser. No. 814,587
Claims priority, application Japan, Apr. 9, 1968, 43/24,172
Int. Cl. C03c 3/04, 3/10; H03h 7/30
U.S. Cl. 106—53 4 Claims

An ultrasonic delay line employing glass as a delay medium. Substitution of 0.5–7.0 mole percent PbF_2 for part of the PbO in a glass composition consisting essentially of 68.0–77.0 mole percent of SiO_2, 15–23 mole percent of PbO, 0.5–3.0 mole percent of Al_2O_3, 0.1–2.0 mole percent of As_2O_3, and 6.5–9.0 mole percent of K_2O produces a glass composition having acoustically stabilized properties that is suitable for a delay line medium. The glass composition has a high mechanical Q, low temperature coefficient of delay time, good acoustical stability with respect to aging, and is easy to produce.

3,598,620
ALKALI-FREE MOLYBDENUM SEALING HARD GLASS
Saleem Akhtar, Wakefield, Mass., assignor to Transitron Electronic Corporation, Wakefield, Mass.
No Drawing. Filed Apr. 24, 1968, Ser. No. 723,899
Int. Cl. C03c 3/08
U.S. Cl. 106—54 8 Claims

An alkali-free, transparent, homogeneous glass composition is provided comprising the following constituent oxides in percent by weight, silicon dioxide 20–30, aluminum oxide 18, boron oxide 39–47, calcium oxide 11–15 and magnesium oxide 1. A method of forming this alkali-free, transparent, glass composition of this invention is also provided. The glass composition is particularly designed for sealing and encapsulation of electronic devices having molybdenum pins or leads.

3,598,621
PLASTER SETTING RETARDER
Peter J. Ferrara, Ridge Road, Cornwall, N.Y. 12518, and Gaston Dalby, % A.M.F.I., P.O. Box 3299, Beirut, Lebanon
No Drawing. Continuation-in-part of applications Ser. No. 673,986, Oct. 9, 1967, and Ser. No. 868,931, Oct. 23, 1969. This application Mar. 9, 1970, Ser. No. 17,957
Int. Cl. C04b 11/14
U.S. Cl. 106—111 12 Claims

Set retarding agents and systems for plaster including: polycarboxylic acids, particularly 1,3,5-pentane tricarboxylic acid; low molecular weight polyamine reaction products thereof; combinations of these with a chelating or coordination agent; and/or combinations of any of the above with boric acid or borax.

3,598,622
ALKALI TREATED STARCH COMPOSITIONS
Thomas Kearney Maher and Howard Paul Francis, La Grange Park, Ill., assignors to CPC International Inc.
No Drawing. Filed Feb. 19, 1969, Ser. No. 800,757
Int. Cl. C08b 25/02; D21h 1/22
U.S. Cl. 106—210 3 Claims

A method is described for producing an improved granular starch product which comprises suspending a bleached, oxidized, or anionic starch in an alkaline aqueous solution, acidifying the solution, and recovering an alkali treated starch product. The use of the improved starch product produced as described above as a wet end additive, a coating color binder, and a size in the manufacture of paper is disclosed. Also revealed is the lowering of the peak viscosity during gelatinization which is attained when bleached or oxidized starch is alkali treated prior to gelatinization.

3,598,623
CARBOXYL STARCH AMINE ETHERS AND PAPER COATING COMPOSITIONS CONTAINING SAME
Robert M. Powers and Roland W. Best, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.
No Drawing. Filed Apr. 24, 1968, Ser. No. 723,883
Int. Cl. C08b 25/02; D21h 1/24
U.S. Cl. 106—214 14 Claims

Carboxyl starch amine ethers having an anionic substituent-to-amine-ether substituent molar ratio of at least

1:1 and paper coating colors containing the carboxyl starch amine ethers as high-strength binders, especially for low weight publication-grade paper.

3,598,624

SIMPLIFIED PROCESSING SYSTEM FOR PREPARATION OF PREDISPERSED PIGMENTS

Daniel Kaufman, Grosse Ile, Mich., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,145
Int. Cl. C09c *1/02*
U.S. Cl. 106—306 3 Claims

A process for preparing dry calcium carbonate pigments which may be easily mixed with water to form slurries suitable for paper coating and other applications. This process comprises mixing calcium carbonate filter cake, dispersant, and inert, finely divided solid material which may be easily separated from the calcium carbonate, separating said inert material from the calcium carbonate and drying said calcium carbonate.

3,598,625

PRODUCTION OF PIGMENTARY GRADE COLORANTS

Geoffrey R. Buckwalter, Flemington, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Nov. 14, 1967, Ser. No. 683,011
Int. Cl. C08h *17/14*
U.S. Cl. 106—309 21 Claims

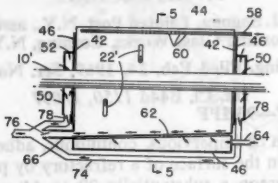
Crude colorants, prior to salt grinding, are subjected to attritioning and shearing actions to break down crystalline structure to non-pigmentary, flocculent form. The time required for salt grinding is reduced, and a stronger pigmentary grade product is obtained. When blue shade phthalocyanine crude is so treated and the salt grinding is carried out in the presence of certain non-aromatic organic liquids, a crystallizing red shade phthalocyanine blue is obtained instead of the customary green shade product obtained by conventional salt grinding of the particular crude colorant. A non-crystallizing red shade phthalocyanine blue pigment is obtained when a partly chlorinated phthalocyanine crude is thus treated.

3,598,626

ELECTROSTATIC METHOD FOR COATING WITH POWDER AND WITHDRAWING UNDEPOSITED POWDER FOR REUSE

Richard O. Probst and Charles R. Thatcher, Indianapolis, and Norbert M. Zupan, Brownsburg, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Application Jan. 5, 1966, Ser. No. 521,481, now Patent No. 3,439,649, which is a continuation-in-part of application Ser. No. 439,790, Mar. 15, 1965. Divided and this application Dec. 30, 1968, Ser. No. 798,563
Int. Cl. B05b *5/02*; B44d *1/094*
U.S. Cl. 117—17 8 Claims



A method for coating an article with powder includes directing one or more air-suspended powder sprays into a chamber through which the article is moved. The sprays are electrostatically deposited on the article. Undeposited powder is fluidized within the chamber and withdrawn in a fluidized state. The fluidized powder so withdrawn may be re-supplied to the sprays.

3,598,627

FUNGUS-RESISTANT SHINGLES

Morris Klimboff, Plainview, N.Y., assignor to The Flintkote Company, New York, N.Y.

No Drawing. Filed Sept. 20, 1967, Ser. No. 669,292
Int. Cl. B44d *1/12*
U.S. Cl. 117—25 12 Claims

There is disclosed herein a fungus-resistant and alga-resistant composition shingle suitable for roofing and siding made of an asphalt-impregnated base that contains embedded on a portion or on all of its weathering surface granular zinc or a granular zinc-containing material along with the usual colored granules on such surfaces.

3,598,628

CATHODE RAY TUBES WITH TARGET SCREENS AND THE MANUFACTURE THEREOF

David M. Goodman, 3843 Debra Court, Seaford, N.Y. 11783

Continuation-in-part of application Ser. No. 85,353, Jan. 27, 1961, now Patent No. 3,091,034, which is a division of application Ser. No. 800,854, Mar. 20, 1959, now Patent No. 3,081,414, which in turn is a continuation-in-part of applications Ser. No. 514,973, June 13, 1955, now Patent No. 2,885,591, Ser. No. 522,609, July 18, 1955, now Patent No. 2,897,388, and Ser. No. 448,039, Aug. 5, 1954, now Patent No. 2,897,398. The instant application is also a continuation-in-part of applications Ser. No. 345,197, Feb. 17, 1964, and Ser. No. 488,017, Sept. 17, 1965. This application Nov. 1, 1968, Ser. No. 772,639
Int. Cl. H01j *31/20*
U.S. Cl. 117—33.5 9 Claims

Target screens for beam-index cathode ray tubes and beam-index color kinescopes are described with ribs, filaments, or projections which support or align the beam-index elements with the remainder of the screen structure. An elongated scintillator-derived light source is positioned parallel to strip-like elements of the target screen to reduce exposure time when the photo-resist, or other photographic, method of screen fabrication is used. Means to further simplify the construction of target screens for color kinescopes are described which use printing techniques (brush, flame-spray, electrostatic spray, etc.) to deposit the different color producing phosphors on the faceplate in register with the index strips.

3,598,629

COLOR CATHODE-RAY TUBE

Carroll John Mellar and Nicholas Zeliotis, Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 711,525, Mar. 8, 1968. This application Jan. 8, 1969, Ser. No. 789,942
Int. Cl. H01j *31/20*
U.S. Cl. 117—33.5C 7 Claims

The image area of a color cathode-ray tube is screened by a slurry process which is generally well known. The slurry has, as ingredients, a gadolinium oxide phosphor, an organic colloid or gel such as polyvinyl alcohol which may be sensitized so that its solubility may be influenced by actinic radiation, deionized water as a solvent and a sensitizer having a metal constituent and soluble in the solvent. Customarily, ammonium dichromate is used and, in solution, produces dichromate ions which may chemically and/or physically react with the polyvinyl alcohol and the phosphor. The slurry process is improved and the screenability of the slurry and the brightness of the color

tube enhanced by including two additives in the slurry. The first is a polydentate chelating agent, such as ethylenediaminetetracetic acid, for reducing the reaction between the sensitizer, the polyvinyl alcohol and the phosphor in the dark, that is to say, in the absence of actinic radiation. The second is a base such as ammonia or an amine, which may have complexing properties, and which shifts the slurry to an alkaline pH more favorable to complexing action.

3,598,630

METHOD OF CONDITIONING THE SURFACE OF ACRYLONITRILE-BUTADIENE-STYRENE

Warren R. Doty, Royal Oak, and Bobbie D. Knight, Tecumseh, Mich., assignors to General Motors Corporation, Detroit, Mich.

No Drawing. Filed Dec. 22, 1967, Ser. No. 692,702

Int. Cl. B44d *1/092*

U.S. Cl. 117—47 4 Claims

A treatment for ABS polymers to improve adhesion of coatings thereto. Improved wettability of the surface results from the oxidation of a portion of the available double bonds on the surface of the polymer. The polymer is treated in a solution containing from 50 to 80 percent by volume of U.S.P. grade orthophosphoric acid (85.3% H_3PO_4) and from 5 grams per liter to saturation of potassium permanganate.

3,598,631

PROCESS FOR MANUFACTURING LOW FRICTION SURFACE

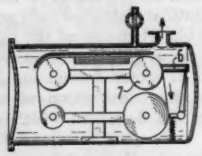
Hermann E. R. Papst, Karl-Maier-Strasse 1, St. Georgen, Black Forest, Germany

Continuation-in-part of application Ser. No. 629,167, Apr. 7, 1967, now Patent No. 3,456,903, dated July 22, 1969. This application Mar. 19, 1969, Ser. No. 808,636

Claims priority, application Germany, Apr. 9, 1966, P 39,186; Sept. 23, 1966, P 41,101

Int. Cl. B44d *1/09*

U.S. Cl. 117—49 6 Claims



A low-friction flow surface for airship envelopes or outer surfaces of airplanes, flow surfaces of wind-tunnels and the like and the process for manufacturing such low-friction flow surfaces wherein a metal foil is heated and, at the same time, de-gassed immediately after which a hydrophobe layer is applied to the heated foil in a vacuum or a protective gas with said hydrophobe layer being applied by squeezing and subsequently even-melting the material of the hydrophobe layer onto the foil.

3,598,632

METHOD OF COATING GLASS SURFACE AND PRODUCTS PRODUCED THEREBY

Alton W. Long, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Continuation of application Ser. No. 647,239, June 19, 1967. This application May 18, 1970, Ser. No. 37,463

Int. Cl. C03c *17/32*

U.S. Cl. 117—69 30 Claims

The method of producing abrasion resistant glass surfaces comprising: pyrolyzing a metal oxide onto the glass surface at temperatures above the pyrolyzing temperature of the metal compound employed, followed by applying to this treated glass surface, an aqueous solution of the reaction product of a hydroxylated organic compound and the interpolymer of methyl vinyl ether and maleic anhydride, at temperatures below 450° F.

3,598,633

PROCESS FOR IMPARTING SOIL RELEASE PROPERTIES TO FIBROUS SUBSTRATES

Joseph T. Rudman, 1051 Bay 25 St., Far Rockaway, N.Y. 11691

No Drawing. Continuation-in-part of application Ser. No. 678,708, Oct. 27, 1967. This application Aug. 2, 1968, Ser. No. 757,182

Int. Cl. B44d *1/16*

U.S. Cl. 117—76 14 Claims

Substrates, particularly synthetic fabrics, are treated to impart soil release properties thereto.

A urethane elastomer is applied to a substrate and dried. The dried substrtae is then treated with a high molecular weight silicon polymer system and the treated material subsequently cured.

The urethane and silicon systems may be water or organic solvent based.

The systems are applied to a selected substrate by conventional means such as padding, knife over roll coating, etc.

3,598,634

COATED PACKAGING MATERIAL

John H. Kraft, Skokie, Ill., assignor to Kraftco Corporation, New York, N.Y.

No Drawing. Filed Nov. 5, 1968, Ser. No. 773,649

Int. Cl. B32b *23/04*

U.S. Cl. 117—86 6 Claims

A wax coated packaging sheet material is provided with improved separating characteristics by applying to the wax surface of a packaging sheet material a homogeneous mixture of an amide and starch in a particular amount. The amide has a molecular weight of at least 200 and preferably has a molecular weight in the range of from about 1,000 to about 50,000. The amide comprises the larger amount of the mixture and the starch comprises a minor amount of the mixture.

3,598,635

PLASMA SPRAYING PROTECTIVE COATING ON REFRACTORY

Gerald J. Sagona, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Feb. 24, 1969, Ser. No. 801,753

Int. Cl. B44d *1/50, 1/097*

U.S. Cl. 117—93.1PF 6 Claims

Formation of impervious, continuous, adherent, metallic coating on the surface of a refractory by plasma flame spraying thereon a substantially 20 to 44 microns sized powder of platinum or platinum base alloy at a velocity of at least 100 feet per second and heating the spray coated refractory to a temperature of at least 1250° C. Plasma gas can be mixture of 3–10%, by volume, hydrogen and balance argon and/or nitrogen. Coated refractory useful as structure that is to contact molten glasses or other hot substances that chemically react with the refractory but not with the metallic coating.

3,598,636

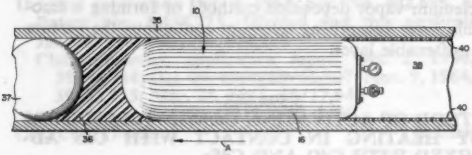
COATING OF INTERIOR SURFACES OF PIPE

Dewitt W. Honeycutt, Jr., Dallas, Tex., assignor to De Soto, Inc., Des Plaines, Ill.

Filed June 17, 1968, Ser. No. 737,692

Int. Cl. B05c 7/08, 8/04, 8/00

U.S. Cl. 117—95 7 Claims



The interior surfaces of pipe are coated by pneumatically propelling through the pipe a coating liquid confined between a coating applicator and a retaining plug using a coating applicator constituted by a cylindrical sleeve which is formed with external longitudinal grooves and which is flexible and resilient to accommodate imperfections in the pipe and which is biased against the interior of the pipe by means of an inflated boot. To facilitate flow-out and to avoid running and sagging, the liquid coating is made thixotropic and to eliminate the need for removing large amounts of solvent, the coating liquid is essentially solvent free and formulated to cure upon exposure to the gas used for pneumatic propulsion and is preferably made to be cured by contact with atmospheric moisture.

3,598,637

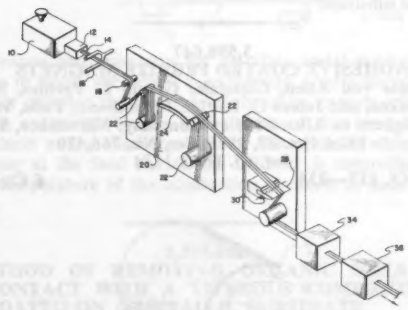
METAL-COATED FIBRILLATED PRODUCTS

Reiner G. Stoll, New York, N.Y., John A. McTaggart, Newark, N.J., and Herbert W. Keuchel, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 29, 1969, Ser. No. 794,905

Int. Cl. D04h 1/04; D02g 3/06

U.S. Cl. 117—107 9 Claims



Lustrous, metal-coated, fibrillated products are produced by extruding a thermoplastic polymer and a foaming agent, attenuating the foamed extrudate while in the molten state to fibrillate it, activating the surface of the fibrillated material, and depositing a thin metallic coating on the fibrillated material.

3,598,638

DIFFUSION METALLIC COATING METHOD

David J. Levine, Cincinnati, Ohio, assignor to General Electric Company

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,199

Int. Cl. C23c 9/02

U.S. Cl. 117—107.2P 3 Claims

A metallic article surface is provided with a diffusion metallic coating of improved oxidation and sulfidation resistance through a vapor diffusion metallic method conducted in a non-oxidizing atmosphere as a result of maintaining the article surface and a coating material which supplies the metallic coating in spaced apart relationship while heating both the surface and the coating material to perform vapor diffusion coating. The article is first provided with a coating of loosely adherent oxide particles which are entrapped in the diffusion coating.

3,598,639

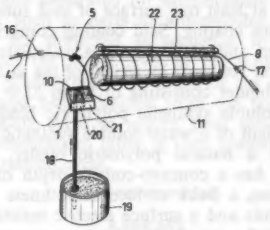
METHOD OF CONTINUOUSLY PRODUCING METAL WIRE AND PROFILES

Bror Olov Nikolaus Hansson, Lars Olov Hertsius, and Johan Olov Bror Hertsius, all of Karlavagen 97, Stockholm N. 11522, Sweden

Filed Dec. 9, 1968, Ser. No. 782,014

Int. Cl. C23c 1/00

U.S. Cl. 117—114R 10 Claims



Metal wire and profiles are continuously manufactured by dipping a helical screw formed core wire into a metal melt. The wire leaves and preferably also enters the melt through its upper surface.

3,598,640

REAR PROJECTION SCREEN, SCREEN COATING AND METHOD

Frank P. Bennett, Northbrook, Ill., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Jan. 19, 1968, Ser. No. 701,039

Int. Cl. C03c 17/32

U.S. Cl. 117—124 9 Claims

A rear projection screen which includes, on the rear or image-receiving face thereof, a coating comprising a transparent organic vehicle and a small proportion of a light-diffusing silica material preferably a synthetic, amorphous silica having generally micron-sized particles, and wherein substantially all of the particles include capillary passages therein, and wherein a substantial proportion of the silica particles are held in place by said vehicle at the outer surface of the coating in a manner such that at least portions of the particles are exposed to atmosphere, rather than being completely embedded in the vehicle of the coating material.

3,598,641

PROCESS FOR IMPROVING THE OIL RELEASE AND ANTI-STATIC PROPERTIES OF A TEXTILE AND THE RESULTING PRODUCT

Harry A. Miller, Harold L. Jackson, Harry M. Johnson, and Charles W. Canter, Altavista, Va., assignors to Klopman Mills, Inc., Rockleigh, N.J.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,220
Int. Cl. B32b *27/08, 27/12*
U.S. Cl. 117—138.8E 7 Claims

A process for improving the oil release and anti-static properties of a textile or other material normally subject to troublesome oil staining and static pickup which comprises treating said material with an aqueous solution of a copolymer of methacrylic acid and dimethylaminoethyl methacrylate, drying and curing.

3,598,642

PRINTABLE POLYSTYRENE SHEET MATERIAL

Ching Yun Huang, Minoo-shi, and Akitoshi Kashiwagi, Toyonaka, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Continuation of application Ser. No. 623,251, Mar. 15, 1967. This application Nov. 12, 1969, Ser. No. 871,588
Claims priority, application Japan, Mar. 18, 1966, 41/16,911
Int. Cl. B32b *27/04, 27/20*
U.S. Cl. 117—138.8 12 Claims

Sheet material comprising a foamed polystyrene sheet as a substrate, at least one surface of said substrate having a continuous coating. Said coating comprises an inorganic pigment and 15 to 50 parts, calculated as solid content based on 100 parts by weight of the said inorganic pigment, of a binder consisting of 80 to 55% by weight of a water-insoluble synthetic polymeric binder and 20 to 45% by weight of a water-soluble synthetic polymeric binder and/or a natural polymeric binder. Paper-like sheet material has a concavo-convex depth of no more than 30 microns, a Bekk surface smoothness of no less than 200 seconds and a surface electric resistance of no more than 10^{11} ohm.

3,598,643

METHOD OF MAKING A SINTERED CADMIUM-CONTAINING PHOTOCONDUCTOR

Harvey A. Hodes, Eatontown, N.J., James Sobieski, St. Paul, Minn., and Michael C. Zerner, Uppsala, Sweden, assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,775
Int. Cl. G03g *5/02;* C09d *5/24;* H01i *13/00*
U.S. Cl. 117—201 8 Claims

A sintered photoconductor is made by first mixing a photoconductive powder such as cadmium sulfide, cadmium selenide, or cadmium sulfoselenide with about 10 percent by weight of the photoconductive powder of cadmium chloride powder. The mix is added to an amount of glycerine about one quarter to about one half times by weight of the photoconductive powder. The resulting mixture is vigorously stirred for about forty-five minutes at a temperature of about 100° C. to 125° C. to form a slurry. The slurry is then coated onto a suitable substrate using a doctor blade to obtain a smooth layer. The slurry coated substrate is then placed on a hot plate at a temperature from about 200° C. to about 250° C. until all of the glycerine has been removed. The coated substrate is then placed in an oven that has been previously heated to about 250° C. The oven temperature is then raised to about 500° C. to 550° C. while a flow of nitrogen is maintained during a sintering cycle of about 20 to 25 minutes.

3,598,644

IMAGING MEMBER FABRICATION

William L. Goffe, Webster, Arnold L. Pundsack, Mortimer Levy, and David A. Buckley, Rochester, and Frank G. Belli, Webster, N.Y., and Peter J. Cerlon, Closter, N.J., assignors to Xerox Corporation, Rochester, N.Y.

Continuation of application Ser. No. 813,345, Apr. 3, 1969, which is a continuation-in-part of application Ser. No. 423,167, Jan. 4, 1965. This application Mar. 17, 1970, Ser. No. 19,521
Int. Cl. C09d *5/24;* G03g *5/04*
U.S. Cl. 117—201 32 Claims

Selenium vapor deposition methods of forming a fracturable layer comprising selenium contiguous the surface of a softenable layer.

3,598,645

METHOD OF ACTIVATING CdS-PHOTORESISTORS BY HEATING IN CONTACT WITH CdS ADMIXED WITH CdO AND CdSe

Hans Winter, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,772
Claims priority, application Germany, Dec. 15, 1967, P 16 14 351.4
Int. Cl. H01l *7/36;* B44d *1/02, 1/18*
U.S. Cl. 117—201 22 Claims

A method of activating and/or recrystallizing a CdS-photoresistor in which a CdS body is heated in contact with a powder mixture of CdS, CdSe and CdO in an oxygen-free atmosphere.

3,598,646

METHOD FOR PREPARING OXIDE-COATED CATHODES

John Joseph Moscony, Lancaster, Pa., assignor to RCA Corporation

No Drawing. Filed May 28, 1968, Ser. No. 732,515
Int. Cl. C23c *3/00, 11/00*
U.S. Cl. 117—224 5 Claims

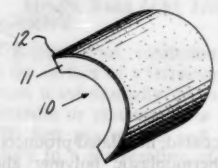
An oxide-coated cathode for an electron tube is prepared with particles of a composition containing at least one alkaline earth metal compound, the compound being heat decomposable to an oxide. The particles are coated with metallic cobalt, preferably produced by the decomposition of dicobalt octacarbonyl in a solution in which the particles are suspended. Subsequently, a layer of the coated particles is coated on a cathode substrate. The cathode is then assembled into an electron tube. During the subsequent tube fabrication, the layer is heated so as to drive off the volatile matter therein and to consolidate the coated particles into a sintered electron-emissive coating on the substrate.

3,598,647

ADHESIVE COATED FERRITE MAGNETS

Theodor von Alten, Glendale, Gerald L. Peebles, Milwaukee, and James G. Battige, Menomonee Falls, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

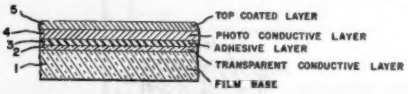
Filed Oct. 10, 1968, Ser. No. 766,420
Int. Cl. H01f *1/34*
U.S. Cl. 117—234 6 Claims



Ferrite magnets with a coating, which may be continuous or discontinuous, of a dry, solid partially-cured adhesive so that the magnets can be attached to other articles, such as magnetic steel members, by final cure of the ad-

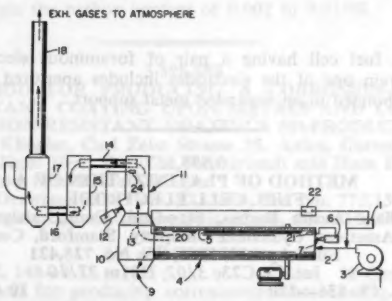
hesive coating upon the application of heat and pressure. Particularly effective adhesive coating compositions and methods for their application to ferrite magnets are also disclosed.

3,598,648
MATERIALS IN ELECTROPHOTOGRAPHIC PROCESS
Yoshiki Hayashi, Hirakata-shi, and Hikofumi Oido, Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Original application Oct. 4, 1965, Ser. No. 492,695, now Patent No. 3,438,773. Divided and this application Jan. 28, 1969, Ser. No. 834,182
Claims priority, application Japan, Oct. 2, 1964, 39/56,714; Oct. 29, 1964, 39/61,927; Nov. 9, 1964, 39/63,913; Mar. 26, 1965, 40/17,946
Int. Cl. H01f *1/00, 1/20*
U.S. Cl. 117—234 **2 Claims**



A magnetic brush comprising a permanent magnet and a mass of iron powder coated with fluorowax which is useful in electrophotographic processes.

3,598,649
METHOD AND APPARATUS FOR DE-OILING METAL CHIPS AND THE LIKE
Aurelius Mark Juhasz, Cleveland, Ohio, assignor to Bartlett-Snow, a division of Bangor Punta Operations, Inc., Bangor, Maine
Filed Oct. 22, 1968, Ser. No. 769,549
Int. Cl. B08b *7/00*
U.S. Cl. 134—2 **1 Claim**

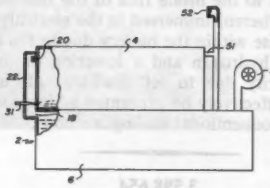


Process and apparatus for de-oiling metal cuttings or chips in which such chips pass through a refractory lined rotary cylinder, the feed rate of the chips to such cylinder being controlled by the temperature of the combustion products at the discharge end of the cylinder while the burner at the feed end of the cylinder is controlled by the temperature of the combustion products at such feed end.

3,598,650
METHOD OF REMOVING ORGANIC SOILS IN CONTACT WITH A VITREOUS COMPOSITION COATED ON A METALLIC SUBSTRATE
William S. Lee, Bay Village, Ohio, assignor to Ferro Corporation, Cleveland, Ohio
No Drawing. Original application Mar. 22, 1968, Ser. No 715,186. Divided and this application Dec. 23, 1968, Ser. No. 840,859
Int. Cl. A21b *1/00*; B08b *7/00*
U.S. Cl. 134—2 **8 Claims**

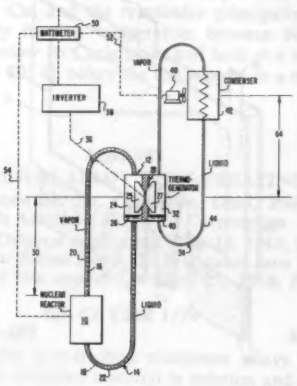
A porcelain enamel frit containing a high level of an oxidation inducing metal oxide, preferably cobalt, adaptable to be incorporated into a vitreous porcelain enamel for application to an oven liner, said enamel characterized by the ability to completely oxidize oven soils when heated to a point above 350° F., but below 600° F., and method of utilizing same as a self-cleaning oven liner coating.

3,598,651
METHOD AND APPARATUS FOR CLEANING MACHINE PARTS AND THE LIKE
Viljo K. Valavaara, 310 Clarke St., Woodstock, Ontario, Canada
Filed June 9, 1969, Ser. No. 831,632
Claims priority, application Canada, June 12, 1968, 22,404
Int. Cl. B08b *3/04, 15/00*
U.S. Cl. 134—25A **2 Claims**



Method and apparatus for continuously cleaning machine parts, such as parts of automobiles. The parts to be cleaned are subjected, in sequence, to cleaning and rinsing cycles the liquid level in the tank being maintained at a predetermined level during the cleaning cycle and the liquid being drained from the tank at the end of the cleaning cycle to ensure good settlement of entrained sedimentation; latter is then removed during the subsequent rinsing cycle.

3,598,652
NUCLEAR THERMOELECTRIC POWER PLANT
Robert E. Magladry, Baltimore, Md., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Nov. 18, 1965, Ser. No. 508,451
Int. Cl. G21h *1/10*
U.S. Cl. 136—202 **12 Claims**



The employment of a low pressure vaporizable liquid such as tetraphosphorus trisulfide within the primary loop

of a nuclear powered thermoelectric converter to prevent high intensity radiation reaching the thermoelectric conversion unit.

3,598,653
SEALED-TYPE LEAD STORAGE BATTERY WITH GAS RECOMBINING MEANS

Masataro Fukuda, Toyonaka-shi, Takashi Miura, Fujisawa-shi, and Katsuhiro Takahashi, Hirakata-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1969, Ser. No. 873,403
Claims priority, application Japan, Nov. 6, 1968, 43/81,739; Sept. 19, 1969, 44/76,063, 44/76,087
Int. Cl. H01m *1/08*
U.S. Cl. 136—26 6 Claims

In a sealed-type lead storage battery, a reactive element having waterproofing capacity and catalytic activity is interposed between the interior and exterior gaseous phases of the battery and an electrolyte-impregnated body is closely attached to the inside face of the reactive element with a portion thereof immersed in the electrolyte, whereby a pressure rise within the battery due to the accumulation of excess hydrogen and a lowering of the positive electrode capacity due to self-discharge of the positive electrode can effectively be prevented which could not be solved by the conventional sealing methods.

3,598,654
SOLID STATE BATTERY WITH SOLID ELECTROLYTE

Wayne Richard Hruden, 175 Tecumseh Ave. West, Windsor, Ontario, Canada

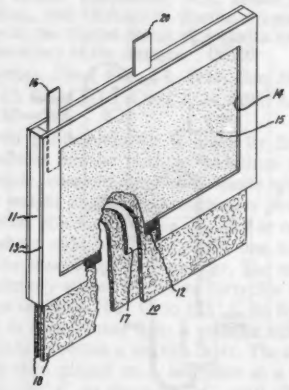
No Drawing. Filed June 4, 1968, Ser. No. 734,254
Int. Cl. H01m *11/00*
U.S. Cl. 136—83R 1 Claim

Compounds capable of ionic conduction (ionophores) having the form M_2AgI_3 where M is a univalent electropositive element or radical used in solid state electrochemical devices such as batteries.

3,598,655
METAL-AIR CELL

Robert P. Hamlen, Scotia, and Elihu C. Jerabek, Voorheesville, N.Y., assignors to General Electric Company

Filed Apr. 1, 1968, Ser. No. 717,856
Int. Cl. H01m *7/00, 29/04*
U.S. Cl. 136—86 2 Claims

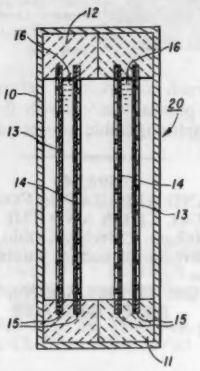


A metal-air cell has at least one cathode electrode, at least one precipitate-producing anode electrode spaced from the cathode electrode, and an absorbent electrolyte matrix positioned between and in contact with the electrodes, the matrix extending beyond one of the edges of the respective electrodes and adapted to contact a separate electrolyte source. This cell provides a structure in which a self-cleaning anode is produced by the employment of the extended matrix and separate electrolyte source.

3,598,656
FUEL CELL UTILIZING APERTURED METAL FOIL ELECTRODES

Isaac Trachtenberg, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original application Oct. 31, 1966, Ser. No. 590,724, now Patent No. 3,471,338, dated Oct. 7, 1969. Divided and this application Mar. 13, 1969, Ser. No. 844,680
Int. Cl. H01m *13/00, 27/00*
U.S. Cl. 136—86 2 Claims

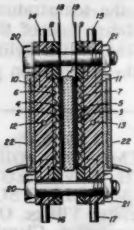


A fuel cell having a pair of foraminous electrodes wherein one of the electrodes includes apertured metal foil bonded to an expanded metal support.

3,598,657
METHOD OF PLATINIZATION OF A FUEL CELL ELECTRODE

William Austin Barber, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 30, 1968, Ser. No. 725,421
Int. Cl. C23c *3/02;* H01m *27/10*
U.S. Cl. 136—120 10 Claims



A method for enhancing a catalytic electrode adapted for use in a fuel cell which comprises: incorporating a reducing agent into an electrode structure during initial fabrication of the said electrode prior to catalyst incorporation therein; contacting the so-formed electrode

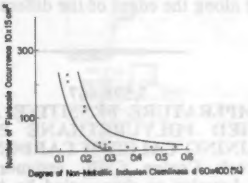
with a noble metal or non-noble metal catalyst compound dissolved in a solvent medium and effecting reduction of said metal compound, whereby catalyst is uniformly deposited on said electrode.

3,598,658

METHOD FOR MANUFACTURING COLD-ROLLED STEEL SHEET

Kameo Matsukura and Masami Ozawa, Kitakyushu, Japan, assignors to Yawata Iron & Steel Co., Ltd., Tokyo, Japan

Filed May 20, 1968, Ser. No. 730,532
Claims priority, application Japan, May 20, 1967, 42/31,948; Mar. 4, 1968, 43/14,253, 43/14,254
Int. Cl. C21d 7/02; C21c 7/00
U.S. Cl. 148—2 7 Claims



A method of manufacturing cold-rolled steel sheet comprising steps of producing ingots from a molten steel composed mainly of 0.06 to 0.15% C and 0.10 to 0.25% Mn, to which less than 0.06% Cu and 0.015 to 0.035% P are included and more over at least one element selected from the group consisting of V, Nb, Al, Ti and Zr is included in small amount, if desired, while regulating non-metallic inclusion cleanliness of the steel sheet to 0.2 to 0.5% and subjecting a steel sheet obtained through hot-rolling and cold-rolling to a decarburizing annealing to reduce the carbon content of 0.002 to 0.015%.

3,598,659

METHOD FOR PRODUCING A CORROSION-RESISTANT COATING UPON METALS AND CORROSION-RESISTANT COATINGS SO-PRODUCED

Adolf Klingler, Carl Zeiss Strasse 35, Aalen, Germany, and Hans Heiz, Dulliken, Switzerland; said Hans Heiz assignor to said Adolf Klingler

No Drawing. Filed Nov. 12, 1968, Ser. No. 775,136
Claims priority, application Switzerland, Nov. 15, 1967, 15,967/68
Int. Cl. G23f 7/10
U.S. Cl. 148—6.15 12 Claims

Method for producing corrosion-resistant coating on metals, particularly iron, and coating so-produced. The coating comprises two layers, the first of which is a mixture of materials which pacifies the metal surface, and adheres tightly thereto while remaining flexible. The first layer includes phosphoric acid; Fe_3O_4 or MnO_2; powdered aluminum, zinc, copper or mixtures; oil modified alkyd resin; talcum, bentonite, gypsum or lime; and a mixture of solvents. The second layer provides good mechanical strength to the corrosion resistant coating.

3,598,660

METHOD OF MANUFACTURING FREE MACHINING STAINLESS STEEL

Joseph A. Ferree, Jr., Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa

No Drawing. Filed May 29, 1969, Ser. No. 829,122
Int. Cl. C21d 7/13; C22c 39/14
U.S. Cl. 148—12 3 Claims

Described herein is an improved method of manufacturing free machining stainless steels to avoid unduly elongating the inclusions contained therein.

3,598,661

HIGH STRENGTH COBALT BASE ALLOY

Robert B. Herchenroeder, Kokomo, Ind., assignor to Cabot Corporation

Filed Dec. 11, 1968, Ser. No. 782,869
Int. Cl. C22c 19/00
U.S. Cl. 148—32.5 5 Claims

Cobalt base alloy containing a minor proportion of beryllium characterized by being substantially face centered cubic in structure and having increased strength and hardness.

3,598,662

METHOD OF MANUFACTURING ANISOTROPIC PERMANENT MAGNETS

Krijn Jacobus de Vos and Pieter Aart Naastepad, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed May 13, 1968, Ser. No. 728,751
Claims priority, application Netherlands, June 9, 1967, 6708112
Int. Cl. H01f 1/04
U.S. Cl. 148—103 1 Claim

A method of manufacturing an anisotropic permanent magnet wherein a ferrous alloy consisting of 28 to 45% of Co, 10 to 20% of Ni, 7 to 9% of Al, 7 to 10% of Ti, up to 6% of Cu, and the remainder principally iron is quenched only from a temperature between 900° and 1000° C. to below its Curie point and held at a temperature of 10° to 70° C. below the Curie point in a magnetic field.

3,598,663

ALUMINUM ALLOY HEAT-TREATING

Herbert Greenewald, Jr., Columbus, Ohio, assignor to North American Rockwell Corporation

No Drawing. Original application Mar. 13, 1968, Ser. No. 712,674, now Patent No. 3,515,546, dated June 2, 1970. Divided and this application Mar. 25, 1968, Ser. No. 715,527
Int. Cl. C21d 1/74
U.S. Cl. 148—159 4 Claims

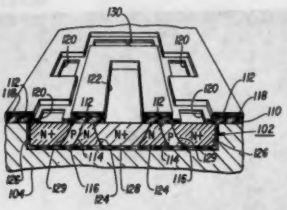
A method for heat-treating aluminum alloys wherein the completely solidified material is solution and homogenization heat-treated in a vacuum environment at a temperature in the range extending from the alloy solidus temperature to the alloy solid solubility limit temperature a sufficient time to develop improved physical and metallurgical properties upon subsequent cooling and aging.

3,598,664

HIGH FREQUENCY TRANSISTOR AND PROCESS FOR FABRICATING SAME

Jack S. Kilby, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original application Dec. 29, 1964, Ser. No. 421,880, now Patent No. 3,411,051, dated Nov. 12, 1968. Divided and this application Dec. 6, 1967, Ser. No. 705,254
Int. Cl. H01l 7/36, 5/00, 13/00
U.S. Cl. 148—175 7 Claims



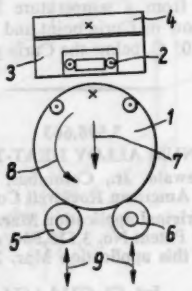
An integrated circuit is provided wherein a transistor structure is comprised of a single crystal of semiconductor material embedded in a substrate and having an exposed surface substantially coplanar with a substrate surface. The crystal is electrically isolated from the substrate by a layer of insulating oxide disposed between the crystal and the substrate. The crystal is divided into a collector region, a base region and an emitter region which are disposed generally in edge-to-edge relationship. An insulating film is disposed over the surface of the substrate and the surface of the crystal, and metallic terminals extend through apertures in the insulating film into contact with each of the active regions.

3,598,665

METHOD OF HOT STRAIGHTENING ELONGATED METAL WORKPIECES

Gerhard Seulen and Friedhelm Reinke, Remscheid, Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Oct. 20, 1967, Ser. No. 676,753
Claims priority, application Germany, Nov. 16, 1966, A 54,099
Int. Cl. C21d 1/78
U.S. Cl. 148—131 13 Claims



A method of straightening bent metal workpieces by non-mechanical means, namely by the use of magnetic flux generated by inductive heating moving the heated workpiece against stop members whereby straightening is achieved.

3,598,666

FORMATION OF JUNCTIONS IN SILICON CARBIDE BY SELECTIVE DIFFUSION OF DOPANTS

Arrigo Addamiano, Willoughby, Ohio, assignor to General Electric Company

Filed May 27, 1968, Ser. No. 732,442
Int. Cl. H01l 7/62
U.S. Cl. 148—187 3 Claims

In subjecting n-type SiC to diffusion of boron and aluminum at high temperatures in order to create a p-type region, diffusion has been found not to take place where crystals overlap. By covering a silicon carbide crystal or platelet with pieces of silicon carbide crystals where diffusion is to be prevented and exposing the remainder, desired patterns or symbols can be created in the platelet which will light up when suitably contacted. Surface junctions may also be created in this way which will provide lines of light along the edges of the different regions.

3,598,667

LOW TEMPERATURE SENSITIVE ALUMINUM-ENRICHED POLYURETHANE PROPELLANT CONTAINING CALCIUM CARBONATE

Fred H. Brock, Covina, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 22, 1965, Ser. No. 502,688
Int. Cl. C06d 5/06
U.S. Cl. 149—19 3 Claims

An aluminum-enriched polyurethane propellant with low temperature sensitivity obtained by adding a small amount of calcium carbonate to the formulation.

3,598,668

STAPLE-CONTAINING SOLID PROPELLANT GRAIN AND METHOD OF PREPARATION

David C. Sayles, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Nov. 30, 1965, Ser. No. 511,027
Int. Cl. C06d 5/06
U.S. Cl. 149—19 6 Claims

Solid propellant grains containing aligned metal staples and a method of preparing the same. In the method of this invention, a solid propellant grain containing metal staples oriented perpendicular to the burning surface is prepared by intimately mixing metal staples with the remaining propellant ingredients to form a castable, doughlike mixture, casting the mixture into a mold, applying a magnetic field to orient the fragments perpendicular to the burning surface and curing the oriented mixture. By using composite stapes containing both a propellant fuel metal and a ferromagnetic metal, the staples of this invention can be aligned without undue sacrifice of favorable fuel properties.

3,598,669

METHOD OF RAPIDLY ETCHING SILICON NITRIDE IN MANUFACTURE OF SEMICONDUCTOR DEVICES

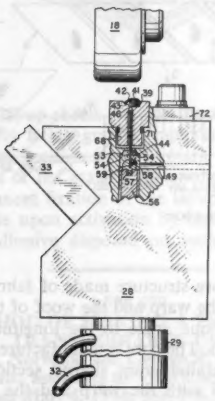
Else Kooi, Emmasingel, Endhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Sept. 14, 1967, Ser. No. 667,639
Claims priority, application Netherlands, Sept. 15, 1966, 6613011
Int. Cl. C23c 11/08; H01l 7/00
U.S. Cl. 156—17 3 Claims

A method of manufacturing a semiconductor device is described in which selected portions of a silicon nitride layer are rapidly etched off by first heating in an oxygen-

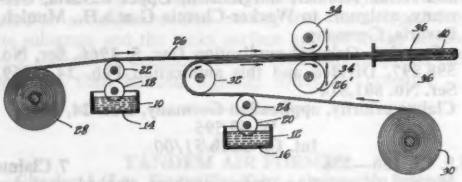
containing atmosphere in the presence of lead oxide to convert to a mixed lead-silicon-oxide and then etched with hydrofluoric acid.

3,598,670
APPARATUS FOR APPLYING ADHESIVE TO SPIRALLY TAPED WIRE INSULATION
Carroll G. Haugen and James R. Greening, Sycamore, Ill., John J. Hill, Harrisonville, Mo., and Charles H. Davis, Shrewsbury, N.J., assignors to Anaconda Wire and Cable Company
Filed June 25, 1968, Ser. No. 739,757
Int. Cl. H01b *13/10*
U.S. Cl. 156—54 **8 Claims**



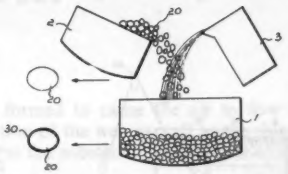
In wire that is insulated by means of a spirally applied longitudinal tape the edge of the tape is sealed by applying adhesive through a bore that opens against the inside of the open flap of the tape.

3,598,671
METHOD OF PREPARING FOAM PLASTIC LAMINATED STRUCTURES
Harold Wortman, 5936 Monroe, Morton Grove, Ill. 60053
Filed July 24, 1968, Ser. No. 747,175
Int. Cl. B29c *27/08*
U.S. Cl. 156—73 **6 Claims**



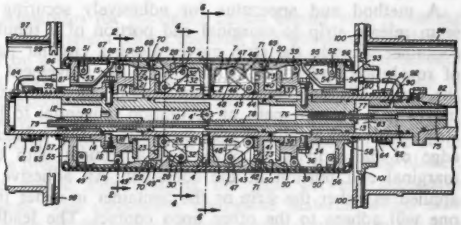
A method of preparing foam plastic laminated structures wherein the reactive components necessary to form a plastic foam are separately applied to opposed surfaces of a base material whereby, when the said surfaces are brought into proximity to one another, the different reactive components thereon will intermix and react to form an adherent foam of preselected density and thickness therebetween.

3,598,672
METHOD OF PRODUCING SHAPED BODIES OF LOW SPECIFIC GRAVITY
Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Continuation-in-part of application Ser. No. 623,882, Mar. 17, 1967. This application Aug. 13, 1968, Ser. No. 752,369
Claims priority, application Switzerland, Mar. 23, 1966, 4,201/66; July 1, 1966, 9,601/66; July 5, 1966, 9,763/66; July 12, 1966, 10,117/66; Oct. 20, 1966, 15,226/66; Aug. 16, 1967, 11,520/67
Int. Cl. B32b *5/18, 31/14*
U.S. Cl. 156—77 **11 Claims**



Bodies of low specific gravity produced by coating a mass of roundish hollow granules, such as expanded or swelled polystyrene granules, with a hardenable liquid binder material, mixing the mass of thus coated granules with a pulverulent solid and/or a fibrous material so as to adhere particles of the solid and/or fibrous material to the coating, and hardening the hardenable binder coating, and shaped cellular structures formed by compressing the mass of hardenable binder coated hollow granules having pulverulent and/or fibrous material adhering to the coating during or prior to the hardening of the hardenable liquid binder material.

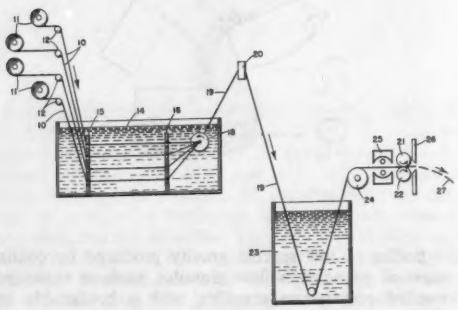
3,598,673
METHOD FOR BUILDING UP PNEUMATIC TIRES
Renato Caretta, Gallarate, Italy, assignor to Pirelli S.p.A., Milan, Italy
Filed Dec. 26, 1967, Ser. No. 693,570
Claims priority, application Italy, Dec. 30, 1966, 31,734/66
Int. Cl. B29h *17/22*
U.S. Cl. 156—132 **12 Claims**



A method for building up pneumatic tires in which the carcass plies are placed over a cylindrical central surface with side portions of the plies extending over cylindrical lateral surfaces to either end of the central sur-

face. The bead cores are positioned over the side portions of the plies on the lateral surfaces and the central and lateral surfaces are expanded to their final position, and the latter also moved axially towards each other, for turning up the side portions of the plies and for positioning the tread band onto the carcass.

3,598,674
PROCESS FOR FORMING POROUS NYLON FIBER RODS
John P. Knudsen, Raleigh, William C. Mallonee, Chapel Hill, and Robert E. Martin, Wilson, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 19, 1968, Ser. No. 785,313
Int. Cl. B29c *17/08*
U.S. Cl. 156—148 **7 Claims**

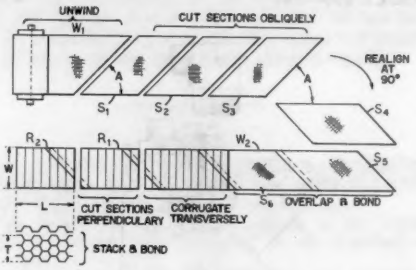


A process for producing porous nylon fiber rods adaptable for use as a wick in fiber point pens includes the formation of a strand of twisted nylon fibers and the autogeneous bonding of adjacent nylon fibers along selected contiguous surfaces to produce a series of interconnecting liquid conducting passageways whereby the resulting fiber rod has a density of from 1.00 to about 0.60 gm./cm.^{3}.

3,598,675
METHOD FOR SECURING STRIP MEMBERS TO CONTAINER BODIES
Karl Bofinger, Cincinnati, Ohio, and Walter Thomas Hake, Wyckoff, N.J., assignors to American Can Company, New York, N.Y.
Filed Nov. 21, 1966, Ser. No. 595,809
Int. Cl. B65h *81/00*
U.S. Cl. 156—172 **13 Claims**

A method and apparatus for adhesively securing a seam release strip to marginal end portion of a tubular container wherein the strip moves along a circular path of revolution and simultaneously with the movement of the strip, the container, rotating about its own axis, moves in a circular path of revolution tangential to the strip's path and axially aligned therewith so that a lateral edge of the strip is in substantial alignment with the marginal end portion of the container. An adhesive is applied to either the strip or the container in order that one will adhere to the other upon contact. The leading portion of the strip contacts the marginal end portion of the rotating container and adheres thereto. The container movement and rotation subsequent to the contracting causes the strip to leave its path of revolution and the remaining portion of the strip to adhere around the marginal end portion of the container. The length of the strip exceeds the circumference of the container causing a trailing portion of the strip to overlap the leading portion upon adherence of the strip to the marginal end portion of the container. The strip is then pressed against the container causing more intimate contact therewith.

3,598,676
METHOD OF MAKING A BIAS WEAVE HONEYCOMB CORE STRUCTURE
Robert G. Noble, Castro Valley, Calif., assignor to Hexcel Corporation, Dublin, Calif.
Filed July 25, 1968, Ser. No. 748,117
Int. Cl. B31f *1/22*
U.S. Cl. 156—205 **8 Claims**



A honeycomb core structure made of fabric reinforced material in which the warp and the woof of the fabric are disposed at an oblique angle to the longitudinal axes of the honeycomb cells. The core is manufactured by forming non-rectangular parallelogram shaped sections of fabric reinforced material with the warp and the woof of the fabric being disposed at an oblique angle to two sides of the parallelogram, joining the other two sides of adjacent parallelograms together in serial relationship to form a web in which the warp and woof of the fabric are disposed at an oblique angle to the lateral edges of the web, cutting the web at right angles to its lateral edge to form equal rectangular sections, superimposing a plurality of rectangular sections one upon another in a stack, and overlapping and adhering contiguous edges of the rectangular sections to one another along spaced parallel bonding lines with the bonding lines of adjacent superimposed sections being staggered relative to one another to define a plurality of adjacent cells whose longitudinal axes are parallel to each other and perpendicular to two sides of the superimposed rectangular sections.

3,598,677
METHOD OF SECURING STACKED PACKAGES AGAINST SLIPPING
Eduard Bergmeister, Hubert Wiest, Joseph Heckmaier, and Heinz Winkler, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany
No Drawing. Original application Dec. 5, 1966, Ser. No. 598,897. Divided and this application Feb. 24, 1969, Ser. No. 801,814
Claims priority, application Germany, Dec. 24, 1965, W 40,595
Int. Cl. B32b *31/00*
U.S. Cl. 156—276 **7 Claims**

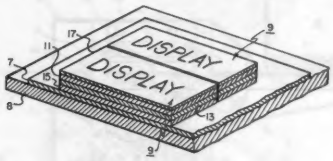
Method of securing objects such as stacked packages of paper, cardboard and the like against slipping, in which adjacent contacting portions of such packages are united by an adhesive comprising an aqueous dispersion of a polymerizate of an olefinic unsaturated compound which forms a film at a temperature of not more than +10° C., in a homogeneous mixture with a substance selected from the group consisting of inorganic and organic pigments.

3,598,678

METHOD AND APPARATUS FOR PREPARATION OF GRAPHIC MATERIALS FOR PRINTING OR DISPLAY

Richard L. Rex, West Lothian, Scotland, assignor to Simpson Taylor and Company Ltd., Edinburgh, Scotland

Filed Nov. 25, 1968, Ser. No. 778,543
Claims priority, application Great Britain, May 30, 1968, 26,005/68
Int. Cl. B41f *27/00*
U.S. Cl. 156—299 4 Claims



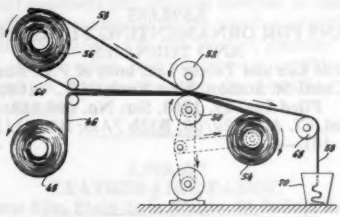
Multilayer layup sheets provide the method and means for temporarily fixing graphic material disposed on the layup sheets in position on a laymark substrate for convenient layout of the graphic materials, and then provide desired permanent fixation of the layup sheets to the laymark substrate upon activation by heat, pressure, or the like, of an adhesive disposed on such layup sheets.

3,598,679

METHOD OF MAKING A PRESSURE-TRANSFERRABLE TAPE

Kitty S. Ettre, Norwalk, and George R. Castles, Stamford, Conn., assignors to Vitta Corporation

Filed Mar. 4, 1968, Ser. No. 710,167
Int. Cl. C09j *7/00*
U.S. Cl. 156—306 9 Claims



A flexible transferrable filmlike casting. Individual thin films are cast onto the flexible supporting substrate by doctor-blading a heavily loaded slurry of a solid inorganic powder mixed with a plasticized binder. The exposed surface of the resulting slurry casting is dried, while the surface contacting the substrate remains tacky and can be used as an adhesive. One casting may be stripped from its substrate and the tacky surface applied to the exposed dry surface of another casting. The superimposed castings are then bonded together solely by pressure.

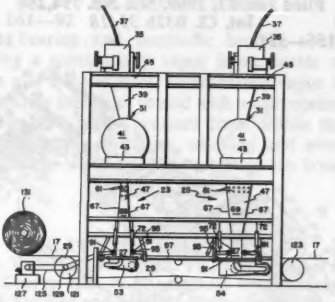
3,598,680

TANDEM AIR FORMER

Charles A. Lee, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.

Filed Apr. 18, 1968, Ser. No. 722,369
Int. Cl. B29j *5/08;* B32b *17/04;* D21f *11/04*
U.S. Cl. 156—377 8 Claims

A fibrous web of non-uniform, cross-sectional thickness is formed in a continuous manner by air laying fibrous material at a first station and then air laying additional fibrous material at a second station downstream from the first to overlap at least partially the fibrous material deposited at the first station. To provide and maintain a precise configuration for the thicker portion of the web, a pressure differential is maintained across the web being formed to cause the air to flow through the thicker portion of the web as well as the thinner portions of the web at the substantially same rate as it approaches the web.

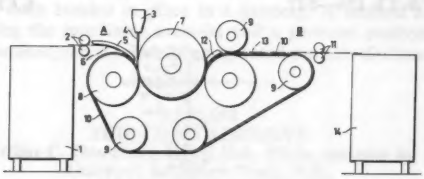


3,598,681

APPARATUS FOR PROVIDING CARTON BLANKS WITH A COATING OF PLASTIC MATERIAL

Torsten Jeppsson, Kjell Ingvar Holmström, and Rolf Magnus Dilot, Lund, Sweden, assignors to AB Akerlund & Rausing, Lund, Sweden

Original application Mar. 20, 1967, Ser. No. 624,561, now Patent No. 3,518,144, dated June 30, 1970. Divided and this application Jan. 15, 1970, Ser. No. 3,053
Claims priority, application Sweden, Mar. 25, 1966, 3,957/66
Int. Cl. B32b *31/18*
U.S. Cl. 156—501 2 Claims

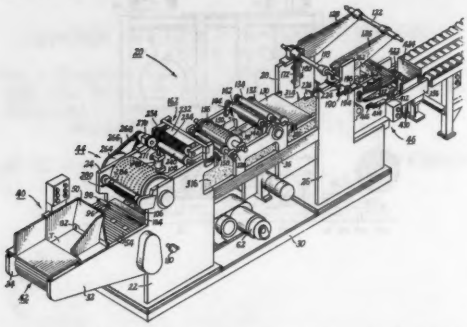


Apparatus for providing carton blanks with a coating of a transparent plastic material and wherein printed matter on a surface of the carton blanks is viewable beneath the plastic coating. The blanks are fed longitudinally in succession and with a slight gap between the edges of successive blanks to a station where the transparent plastic material is extruded as a web and applied in web form by a press roll to the printed surface of the line of blanks, the plastic web bridging the gaps between successive blanks. The continuous composite material which now consists of the web of plastic material united to the line of carton blanks is cooled by a cooling roll and then passed between stretch rolls running at a surface speed in excess of the linear speed of the composite material which serve to accelerate the composite material and hence effect stretching and breaking of the plastic web in the gaps between successive blanks, thus separating the plastic coated blanks from each other.

3,598,682
METHOD AND APPARATUS FOR MAKING TILE PRODUCTS

Frank L. Califano, Hackensack, and Paul N. Shutak, Madison, N.J., assignors to The Flintkote Company, White Plains, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,286
Int. Cl. B32b *31/18*
U.S. Cl. 156—521 14 Claims

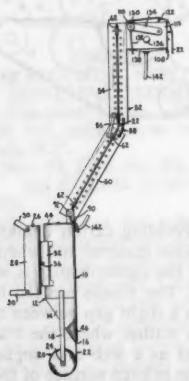


Tile products from a vertically aligned stack are moved by a continuously moving product conveyor into an adhesive coating and paper covering apparatus. There, adhesive is first applied in a controlled pattern to a portion of paper from a continuous roll and the adhesive-coated paper is then cut to size and applied to the tile. The final product comprises a tile upon which has been deposited and bonded an adhesive coating in a predetermined controlled pattern and covered with a protective sheet of paper which then can be peeled away when the tile is installed.

3,598,683
APPARATUS FOR INSTALLING TAPE

Joe E. Butler and John E. Butler, both of 3004 S. 42nd St., St. Joseph, Mo. 64505

Filed June 30, 1969, Ser. No. 837,615
Int. Cl. B32b *31/18;* B44c *7/02*
U.S. Cl. 156—527 6 Claims

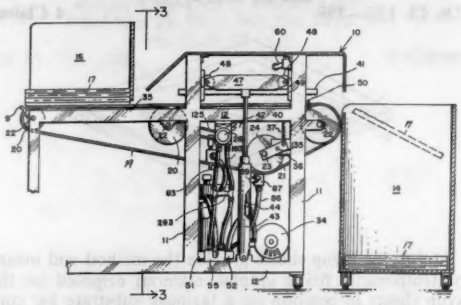


A machine for applying tape to dry wall construction comprising a plaster container supported from a harness worn by a workman. An endless tape is drawn by a plurality of cogged rollers in a tubular, jointed arm through the plaster and delivered to a rotatable, flexible vaned trowel operated by an electric motor. The trowel smooths the tape onto the wall and excess plaster may gravitate through a conduit into the container. A spring return cutting member operated from a draw string is provided for cutting the tape.

3,598,684
AUTOMATIC FUSING PRESS FOR FABRICS

Richard Militana, 7500 Miami View Drive, North Bay Island, Miami Beach, Fla. 33141, and Robert R. Spinelli, 1350 NE. 143rd St., North Miami, Fla. 33161

Filed Jan. 20, 1970, Ser. No. 4,214
Int. Cl. B30b *15/02;* B65h *5/02, 7/04*
U.S. Cl. 156—573 3 Claims

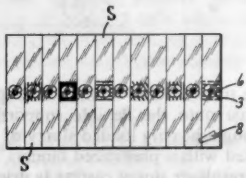


A fusing press for fabrics having a feeder bin at one end and a collection bin at the other end with an endless belt and pulley system for carrying trays having fabrics to be processed thereon from the feeder bins through the apparatus for processing and into the collection bin. Positioned between the feeder bin and collection bin is a hydraulically operated press with heating elements contained therein for subjecting the fabrics in the trays to desired temperatures and pressures with timer means controlling the various operations as long as trays are positioned on the feeder bin.

3,598,685
MEANS FOR ORNAMENTING FINGERNAILS AND TOENAILS

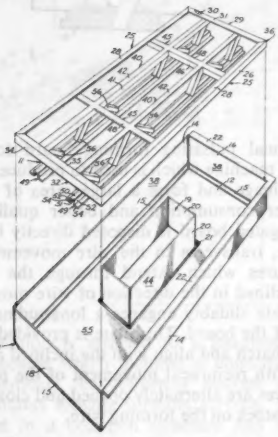
Thomas Lee and Teresa Lee, both of P.O. Box 206, Canal St. Station, New York, N.Y. 10013

Filed Jan. 19, 1968, Ser. No. 699,128
Int. Cl. A45d *29/00;* B32b *7/06;* B44c *1/16*
U.S. Cl. 161—6 4 Claims



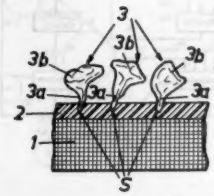
Fingernails and toenails can be ornamented in precise position with tiny floral or other designs to match dress color, make-up or nail lacquer. A heavy vinyl covered board with differently colored rectangles is provided with a plurality of side by side bands each of which has a central portion with a decalcomania transfer pattern, flank portions coated with adhesive and blank terminal portions, which can be omitted in modifications, for handling and manipulating purposes. An applicator is a part of the invention and has crisscross teeth arranged in staggered rows and longitudinally arcuate with a depending tongue projecting at one end for supporting and rubbing action. The strips may optionally be made up as a roll with transverse perforations for severing individual strips, the decalcomania of each of which is protected as by a piece of vinyl plastic or glossy paper.

3,598,686
WALL PANEL FOR BUILDING STRUCTURE COMPRISING A FIBRE GLASS OUTER SHELL AND A FRAME ASSEMBLY POSITIONED WITHIN THE SHELL
John E. Clark, 572 Collier Road NW., Atlanta, Ga. 30318
Filed Feb. 19, 1969, Ser. No. 800,431
Int. Cl. B32b *1/04, 3/12*
U.S. Cl. 161—41 8 Claims



A wall panel and method of making same having a desired shape fiberglass base member and a plurality of metallic support members affixed thereto for welding the wall panel to a building structure. The metallic support members are of a hat or angle shape and are fiberglassed to the base member. An adhesive tape is placed between the support members and the base member to insulate the base member from changes in the weather conditions and from heat being applied to the support member. The exterior of the fiberglass base member is sandblasted and coated with an epoxy compound for providing any desired appearance.

3,598,687
LEATHER-LIKE FABRIC
Adjiman Elie, Place de la Mairie, 95 Belloy, France
Filed Dec. 14, 1967, Ser. No. 690,570
Claims priority, application France, Dec. 22, 1966, 88,417
Int. Cl. D03d *27/00;* D04h *11/00;* D06n *3/00*
U.S. Cl. 161—64 26 Claims

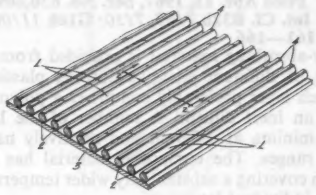


A leather like material having a support with moisture absorption properties at least equal to those of natural leather. The support is coated with an adhesive, which is in turn coated with leather particles each having thin end portions. The leather particles are fixed to the adhesive by means of the thin end portions. The material is made by electrolstatically flocking the leather particles onto the adhesive coated base.

3,598,688
VENTED ROOF SYSTEMS EMPLOYING MICROPOROUS MEMBRANES
Robert G. Bellamy, St. Davids, Pa., assignor to Selby, Battersby & Co., Philadelphia, Pa.
Filed Aug. 26, 1968, Ser. No. 755,199
Int. Cl. D06n *5/00*
U.S. Cl. 161—92 6 Claims

Traffic bearing and nontraffic bearing roof systems comprising a substantially vapor impermeable structural substrate and a waterproof, substantially vapor impermeable protective top layer vented with a microporous membrane to relieve vapor pressure from within the system thereby preventing blistering, cracking and eventual destruction of the weatherproof protective top layer.

3,598,689
GARMENT INTERLINING
Philip C. Feffer, Philadelphia, Pa., and William G. Wolfgang, Cherry Hill, N.J., assignors to Philadelphia College of Textiles and Science, Philadelphia, Pa.
Filed Dec. 16, 1968, Ser. No. 784,058
Int. Cl. A41d *27/06;* B32b *3/16*
U.S. Cl. 161—143 4 Claims



Interlining material for garments comprising a plurality of yarns adhesively secured in closely spaced parallel relation to a peelable backing sheet. An adhesive is also provided on the outer surface of the yarns opposite the backing sheet for permanently bonding the interlining yarns to a surface of the cloth of a garment or other article of the cloth of a garment or other article, the backing sheet being peeled from the yarns after yarns have been bonded in place in a garment. A method for making the interlining material and a garment construction embodying the interlining material are also disclosed.

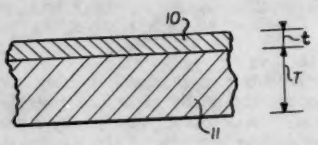
3,598,690
TIRE CORD ADHESIVE
Arthur C. Danielson, Royal Oak, Mich., assignor to Uniroyal, Inc., New York, N.Y.
No Drawing. Filed Nov. 21, 1967, Ser. No. 684,645
Int. Cl. B29h *17/28*
U.S. Cl. 161—144 9 Claims

This invention relates to the method of bonding a vulcanized rubber composition to a textile material and the laminate produced. Particular adhesive enhancing ingredients are added to the rubber before vulcanization to produce a better bond between the vulcanized rubber and the textile material.

3,598,691
MULTI-PLY PAPER FOR INSULATING HIGH TENSION ELECTRIC CABLES
Franco Pasini, Milan, Italy, assignor to Pirelli Societa per Azioni, Milan, Italy
Filed Mar. 8, 1968, Ser. No. 711,582
Claims priority, application Italy, Mar. 25, 1967, 14,189/67
Int. Cl. B32b *7/02*
U.S. Cl. 161—166 12 Claims

Paper tape for insulating high tension cables is produced with a multi-layer construction. A low density core

layer is faced on one or both sides with thin high impermeability layers. The dielectric strength is a function of

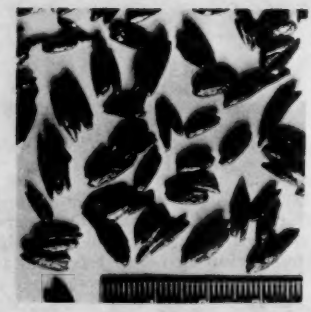


the latter while the impregnability and loss factor is a function of the former. Also, an electric cable insulated with such a tape is disclosed.

3,598,692
THREE LAYER, VINYL CHLORIDE POLYMER, ENERGY-ABSORBING STRUCTURE
Ross Gardner, Jr., Stoughton, Mass., assignor to National Research Corporation, Newton Highlands, Mass.
Filed Apr. 13, 1967, Ser. No. 630,609
Int. Cl. B32b *7/02, 7/30;* **G10k** *11/00*
U.S. Cl. 161—166 **2 Claims**

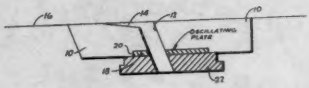
Energy-absorbing material is provided from a number of layers of different energy-absorbing plastic formulations. Each layer preferably comprises a polymeric material and an inert diluent. A number of the layers have rebound minima at different and relatively narrow temperature ranges. The composite material has a rebound minimum covering a substantially wider temperature range than any individual layer.

3,598,693
MOLDING COMPOSITION
Harry M. Andersen, Ballwin, and John D. Calfee, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Sept. 5, 1967, Ser. No. 665,536
Int. Cl. B32b *5/16*
U.S. Cl. 161—170 **13 Claims**



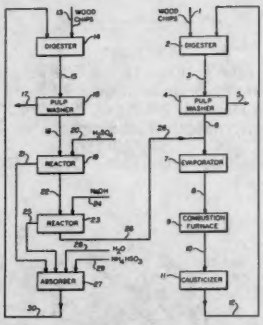
A molding composition comprising grains each containing a plurality of reinforcing fibers in parallel arrangement and embedded in and bonded together by a thermosettable resin which also envelops said plurality of bonded fibers; the method of preparing the composition by contacting an aqueous slurry of the fibers with a liquid, thermosettable resin and a curing agent therefor, advancing the resin to a solid, fusible stage, and recovering said composition from the resulting reaction mixture; the heat-curable extrudate obtained from said composition, and the method of preparing the extrudate.

3,598,694
MECHANICAL PULSATING FORMING BOARD
Philip Wiebe, 22 Albert St., Saint Catharines, Ontario, Canada
Filed Aug. 15, 1969, Ser. No. 850,419
Int. Cl. D21f *1/00*
U.S. Cl. 162—351 **3 Claims**



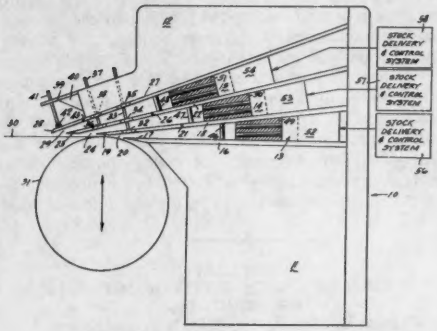
A mechanical pulsating forming board for a Fourdrinier Paper machine which is used to produce turbulence to retard drainage and form a larger area of paper with reduced water consumption and better quality control. The flat elongated board is disposed directly beneath the forming wire, transverse to the wire movement, and includes apertures which extend through the board and which are inclined in the direction of wire movement. An oscillating plate slidably engages a longitudinal recess in the bottom of the board. This plate is provided with apertures which match and align with the inclined apertures in the board. With reciprocal movement of the plate the inclined apertures are alternately opened and closed, thereby pulsating the stock on the forming wire.

3,598,695
PRODUCTION OF WOOD PULP BY AN AMMONIUM SULFITE AND/OR BISULFITE PROCESS COMBINED WITH A SULFATE PROCESS
Hans Waterstradt, Walldorf, Hessen, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed June 26, 1968, Ser. No. 740,194
Claims priority, application Germany, June 26, 1967, M 75,238
Int. Cl. D21c *11/02, 11/04*
U.S. Cl. 162—33 **7 Claims**



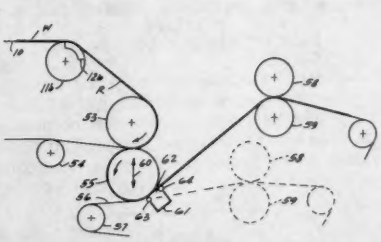
Combined wood pulping processes wherein the conventional ammonium sulfite or bisulfite process is carried out; the conventional sulfate process is carried out; and the spent liquor from the ammonium-based process is treated with sulfuric acid and sodium hydroxide to liberate ammonia, sulfur dioxide and sodium sulfate. The sodium sulfate is used in the liquor recovery portion of the sulfate process, and the ammonia and sulfur dioxide are absorbed in water to produce ammonium sulfite or bisulfite which is used in the ammonium-based pulping process.

3,598,696
MULTIPLE STAGE HYDRAULIC HEADBOX
Ralph A. Beck, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Feb. 14, 1968, Ser. No. 705,418
Int. Cl. D21f 1/06
U.S. Cl. 162—298 4 Claims



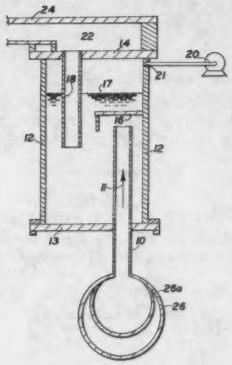
The invention is directed to a headbox for a paper making machine which includes a plurality of stock receiving chambers for delivering discrete stock streams to a continuous moving forming surface. The chambers are formed in a common structure and separated one from the other by wall members. Each of the wall members has ends terminating adjacent the forming surface and the ends of a corresponding pair of wall members constitute the slice opening for the corresponding chamber. Stock is delivered to the forming surface from each of the slice openings in a layer by layer fashion whereby the stock from a second slice opening is laid over the stock from the first slice opening, and the stock from the third slice opening is laid over the stock from the second slice opening.

3,598,697
WEB PICK-UP ARRANGEMENT FOR PAPER MAKING MACHINES
Thomas G. McKie and Arnold J. Schmitt, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed Mar. 6, 1969, Ser. No. 804,827
Int. Cl. D21f 2/00
U.S. Cl. 162—306 2 Claims



Web pick-up arrangement for Fourdrinier type paper making machine, particularly adapted to pick-up newly formed heavy weight webs from the forming wire and to transfer the webs directly to the press felt without the use of a pick-up felt or fabric. The pick-up includes a pick-up roll, which may be a plain surfaced roll and has nip pressure cooperation with the wire as the wire passes about a return roll onto its return run for cleaning. The press felt is maintained in pressure cooperation with the pick-up roll by a transfer device about which the press felt turns to its upwardly facing press run. The transfer device includes an idler roll disposed beneath and rearwardly of the pick-up roll and a suction roll or suction box disposed on the underside of the press felt either at the point of nip engagement of the press felt to the pick-up roll or on the outgoing side of the pick-up roll.

3,598,698
FLOW SPREADING DEVICE
Denis A. Goddard, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Oct. 14, 1968, Ser. No. 767,449
Int. Cl. D21f 1/02
U.S. Cl. 162—340 5 Claims

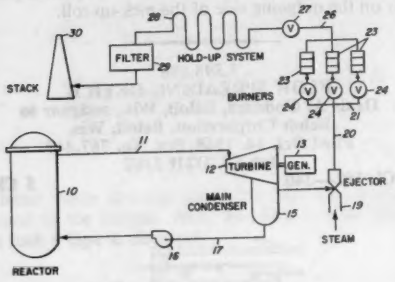


A device for transferring stock comprising inlet means adapted to receive stock from a source, tank means adapted to receive stock from said inlet means, said inlet means being attached to said tank and positioned partially interiorly of said tank, wall means forming a part of said tank means and positioned perpendicular to the direction of flow of stock from said inlet means to form stock direction changing means, outlet means adapted to remove stock from said tank, outlet means being attached to said tank and positioned partially interiorly of said tank and pressure means attached to said tank and adapted to create a pressure in said tank greater than the pressure downstream from said outlet to form means for moving stock through said outlet means. Said outlet means comprising a plurality of uniformly spaced uniformly sized tubes extending from within said tank to a point exterior of said tank. In addition the inlet means is preferably a plurality of tubes extending into the tank. In yet another embodiment, the inlet means further includes a header in communication with the inlet tubes at a point exterior of said tank and adapted to pass stock in a direction perpendicular to the tubes and drain the tank. Preferably, the header is tapered such that the cross-sectional area of the header decreases in the direction of stock flow in said header means.

3,598,699
NUCLEAR REACTOR OFF-GAS BURNER SYSTEM
William A. Hartman, Jr., and Manny Siegler, San Jose, Calif., assignors to General Electric Company
Filed Apr. 9, 1969, Ser. No. 814,769
Int. Cl. C21f 9/02
U.S. Cl. 176—37 4 Claims

A system for burning flammable gas in the off-gas from a nuclear reactor power plant is disclosed. The system includes three porous plugs in series in the off-gas line. The first plug serves as an upstream flame arrestor in case of burner failure. The second porous plug serves as a

burner with a flame ignition means adjacent the downstream face of the plug. The third porous plug serves as a downstream flame arrestor and condenser for the water



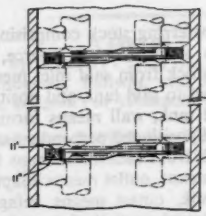
vapor formed in the flame reaction. Each of the porous plugs includes internal cooling means to remove heat. Appropriate temperature sensing means and control means are provided to insure safe, reliable operation.

3,598,700

FUEL LATCH DESIGN

James E. Lambert, Port Hope, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Aug. 21, 1968, Ser. No. 754,296
Int. Cl. G21c *3/32*
U.S. Cl. 176—76 **3 Claims**



A latch for interconnecting, in serially disposed relation, fuel bundles for nuclear power reactors. The latch has a thin bowed profile and is more or less a continuous ring. As such, it has a low neutron capture ratio; readily interlocks and disconnects with adjacent latches; and, axially displaces some of the fuel elements in each bundle to present a more uniform or consistent radiation density across interconnecting latches.

3,598,701

PROCESS FOR PRODUCING L-HOMOSERINE

Katsunobu Tanaka, Machida-shi, Kazuo Ohshima, Tokyo, and Yoh Tokoro and Mitsuyoshi Okii, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,802
Claims priority, application Japan, Sept. 12, 1967, 42/58,130
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 **9 Claims**

A process for producing L-homoserine and L-lysine in substantial amounts by fermentation which comprises culturing L-threonine-requiring microorganisms in media containing suitable amounts of hydrocarbons, nitrogen sources, inorganic compounds and other nutrients necessary for the growth of the microorganisms. Exemplary strains employed include those belonging to the genera Corynebacterium.

3,598,702

MICROBIOLOGICAL PROCESS FOR THE PREPARATION OF PIGMENTING PRODUCTS

Giovanni Franceschi and Arpad Grein, Milan, Italy, assignors to Societa' Farmaceutici Italia, Milan, Italy

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,949
Claims priority, application Italy, May 14, 1968, 16,443A/68
Int. Cl. C12d *13/02*
U.S. Cl. 195—28 **4 Claims**

Described is a microbiological process for the preparation of isorenieratenes of the class consisting of isorenieratene, 3 - oxy-isorenieratene and 3,3'-dioxy-isorenieratene. The process is characterized in that the new microorganism *Streptomyces mediolani* is grown, under aerobic conditions and in submerged culture, in a liquid cultural medium containing a carbon and a nitrogen source and mineral salts. The mycelium containing the pigmenting products is separated from the fermentation broth by filtration or centrifugation, and is usable as an animal foodstuff.

3,598,703

MICROBIOLOGICAL Δ^1-DEHYDROGENATION OF STEROIDS

Thomas H. Stoudt, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of application Ser. No. 258,976, Feb. 18, 1963, which is a continuation-in-part of application Ser. No. 211,821, July 23, 1962, which is a continuation-in-part of applications Ser. No. 535,279, Sept. 19, 1955, and Ser. No. 173,367, Feb. 15, 1962, which is a continuation-in-part of applications Ser. No. 500,273, Apr. 8, 1955, and Ser. No. 165,036, Jan. 8, 1962, which in turn is a continuation-in-part of applications Ser. No. 540,626, Oct. 14, 1955, now Patent No. 3,016,335, Ser. No. 709,798, Jan. 20, 1958, and Ser. No. 552,694, Dec. 13, 1955. This application Sept. 5, 1967, Ser. No. 665,644
Int. Cl. C07c *167/14*
U.S. Cl. 195—51 **75 Claims**

The invention disclosed herein relates to a novel microbiological process whereby unsaturation is introduced into Ring A of the nucleus of 3-oxygenated steroid compounds by reacting a 3-oxygenated steroid having a single bond connecting the C–1 and C–2 carbon atoms with a Δ^1-dehydrogenating strain of Schizomycetes microorganisms, thereby forming the corresponding Δ^1-steroid.

3,598,704

DIAGNOSTIC DEVICE FOR VARIOUS SUGARS

Arne Lennart Dahlqvist, Lund, Sweden, assignor to AB Kabi, Stockholm, Sweden

No Drawing. Filed Dec. 16, 1966, Ser. No. 606,498
Claims priority, application Sweden, Jan. 5, 1966, 152/66
Int. Cl. G01n *21/06, 31/04, 33/16*
U.S. Cl. 195—103.5 **16 Claims**

A diagnostic test indicator strip having an aqueous liquid absorbent ion-exchange-effective cellulose derivative body-fluid test sample absorption portion and contiguous therewith an indicator portion impregnated with peroxidase, an oxidizable chromogen and an oxidase specific to a sugar for which the body fluid is being tested.

3,598,705

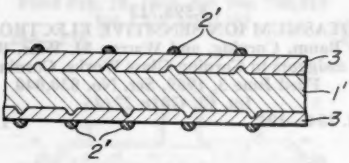
METHOD OF TREATING THE SURFACE OF ALUMINUM AND ALUMINUM ALLOYS, AND INSULATION COATED CONDUCTORS OBTAINED THEREBY

Takashi Suzuki and Takeshi Hamabe, Toyonaka-shi, Japan, assignors to Matsushita Electric Co., Ltd., Osaka, Japan

Filed Nov. 18, 1968, Ser. No. 776,559
Int. Cl. C23b *5/48, 9/02*
U.S. Cl. 204—27 **1 Claim**

A method of treating the surface of aluminum and aluminum alloys, wherein in forming an oxide coating on

said surface by anodic oxidation the thickness of the coating is reduced locally at the positions spaced closely along



the length of the substrate thereby to obtain an electric insulation coating of great flexural strength, and insulation coated conductor produced thereby.

3,598,706

ACID GOLD PLATING BATHS

Emiel Freedman, Warwick, and James N. Shea, Pawtucket, R.I., assignors to Trifari Krussman and Fishel, Inc., New York, N.Y.

No Drawing. Filed Dec. 11, 1967, Ser. No. 689,326
Int. Cl. C23b *5/28*
U.S. Cl. 204—46 3 Claims

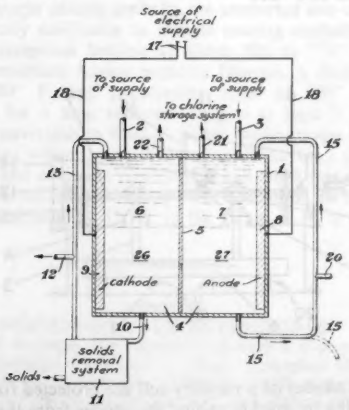
The invention relates to gold cyanide plating baths that are operational at relatively low to very low pH values. The baths disclosed are stable and free from AuCN precipitates at pH values as low as 0.1. This advantageous result is obtained by utilizing in the acid plating baths gold (III) cyanide compounds in which the gold content consists essentially of gold in its three valence form. Especially advantageous results are realized when the plating compound is cyanoauric (III) acid. Novel methods for producing gold (III) cyanide compounds generally and cyanoauric (III) acid specifically also forms part of the invention.

3,598,707

METHOD FOR PRODUCING CHLORINE AND METAL HYDROXIDES

Grafton L. Bergeron and James J. Leddy, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 16, 1968, Ser. No. 796,249
Int. Cl. C01f *11/14*
U.S. Cl. 204—100 4 Claims



A novel electrolytic cell and process for producing both chlorine and alkaline earth hydroxides simultaneously.

3,598,708

SURFACE BROMO-CHLORINATED POLYOLEFINS

Winston J. Jackson, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 27, 1969, Ser. No. 837,324
Int. Cl. C08f *27/03*; C09k *3/28*
U.S. Cl. 204—159.18 15 Claims

Bromo-chlorinated shaped polyolefin articles having improved resistance to burning. The bromo-chlorinated shaped polyolefin articles are prepared by immersing the surface(s) of the articles in a brominating agent and then contacting the surface(s) with a chlorinating agent.

3,598,709

COATING OF ELECTRICALLY CONDUCTIVE SURFACES

Wilhelm E. Walles, Midland, and Elton D. Prueter, Saginaw, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,807
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 6 Claims

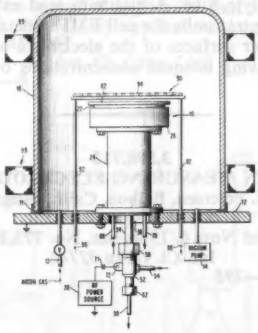
Monolayers of monodisperse synthetic resinous particles are deposited from an aqueous suspension employing an electrical field of between about 1.5 and 3 volts per centimeter.

3,598,710

ETCHING METHOD

Pieter D. Davidse, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

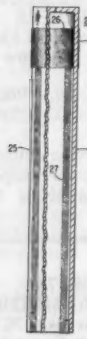
Filed Apr. 4, 1966, Ser. No. 540,054
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 5 Claims



The object to be sputter etched is excited in a reduced atmosphere of inert gas by an alternation RF potential which is supplied through a capacitive coupling circuit to set up a glow discharge around the object. During those periods when the alternating RF potential biases the object negative with respect to this glow discharge, the object attracts positive ions to perform this sputter etching. During the intervening period, when the alternating RF potential biases the object positive, electrons are attracted to the target. Under these conditions, sputter etching will continue without the accumulation of a positive charge around the object being etched. Therefore, it is not necessary to maintain the large conductive surface at a negative potential with an electrical connection to an outside source of electrical energy. Even minute quantities of such

dielectric materials can be removed from small chemically etched holes which are to ultimately be locations for electrical contacts to semiconductor devices.

3,598,711
ELECTROCHEMICAL OXYGEN ANALYZER
Louis R. Flais, Alliance, Ohio, assignor to Bailey Meter Company
Filed Nov. 15, 1967, Ser. No. 683,315
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 7 Claims

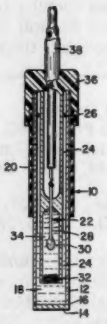


An electrochemical cell having a zirconium-oxide tubular electrolyte with a porous platinum electrode bonded to the inner surface of the eletrolyte tube and a similar platinum electrode bonded to the outer surface of the electrolyte tube. A platinum lead extending from each electrode transmits the cell EMF generated when the inner and outer surfaces of the electrolyte are in contact with gases having unequal concentrations of oxygen.

3,598,712
ION MEASURING ELECTRODE
Arne J. Petersen, Balboa, Calif., assignor to Beckman Instruments, Inc.
Filed Nov. 4, 1968, Ser. No. 773,203
Int. Cl. G01n *37/46*
U.S. Cl. 204—195 6 Claims

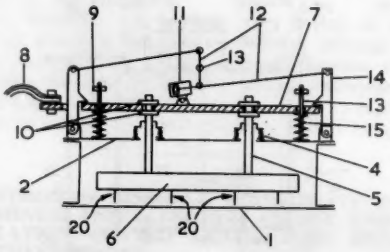
An ion measuring electrode in which means is provided for replaceably mounting an ion sensitive glass bulb structure on the end of a plastic salt bridge tube of the electrode so that a selected one of a variety of such structures having different glass compositions may be mounted to the tube for making different ion concentration measurements.

3,598,713
POTASSIUM ION SENSITIVE ELECTRODE
George Baum, Corning, and Warren M. Wise, Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed June 3, 1969, Ser. No. 830,040
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 11 Claims



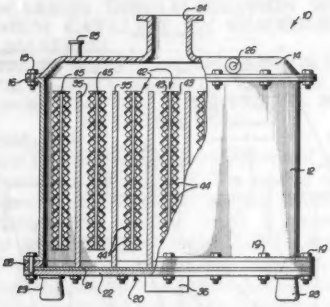
An electrode for measuring the concentration of potassium ions in an aqueous solution wherein the sensing portion is a liquid organic phase containing a potassium substituted tetraphenylborate dissolved in a suitable organic solvent.

3,598,714
APPARATUS FOR PROTECTING THE ANODES OF AN ELECTROLYTIC CELL AGAINST SHORT CIRCUITING
Robert Schoberle, Roermond, Netherlands, assignor to Solvay et Cie, Brussels, Belgium
Filed Oct. 23, 1968, Ser. No. 770,045
Claims priority, application Belgium, Oct. 31, 1967, 50,297, Patent 705,921; Nov. 23, 1967, 51,167, Patent 706,879
Int. Cl. C22d *1/04*; B01k *3/00*
U.S. Cl. 204—219 5 Claims



The anodes of a mercury cell are protected from short-circuiting by quickly raising the anodes from the mercury cathode under the impulse of a short-circuiting detector comprising conducting probes projecting from the anodes and which come into contact with the mercury before the anodes themselves.

3,598,715
ELECTROLYTIC CELL
Duane N. Goens, Fullerton, and Thomas W. Clapper, Whittier, Calif., assignors to American Potash & Chemical Corporation, Los Angeles, Calif.
Filed Feb. 28, 1968, Ser. No. 708,819
Int. Cl. C22d 1/02
U.S. Cl. 204—278 4 Claims



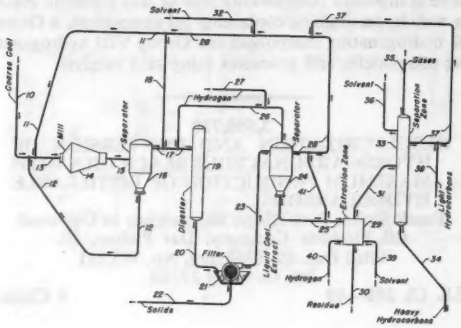
An electrolytic cell comprising a tank having a closed top and an open bottom. An anode closure plate extends over the bottom of the tank to form the bottom wall of the cell. A plurality of vertically positioned anodes are secured to the closure plate and are spaced to receive a cathode member between adjacent pairs of anodes. The electrodes are mounted in the cell in a manner such that they are completely submerged in electrolyte in the cell.

3,598,716
ASPHALT OXIDATION
Eugene M. Fauber, Hammond, Ind., assignor to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Apr. 20, 1970, Ser. No. 30,214
Int. Cl. C10g 1/00
U.S. Cl. 208—6 5 Claims

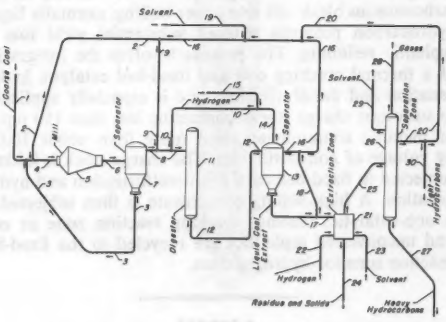
A method of manufacturing oxidized, coating grade asphalts wherein asphalt charge stocks, suitable as such for use as roofing felt saturants and directly oxidizable to shingle saturants but not, without blending, directly oxidizable to shingle coating asphalts, are converted into charges also directly oxidizable to shingle coating asphalts. The method comprises heating at about 700 to 775° F. an asphalt residuum having negative Oliensis, a flash point above 500° F. and a softening point of 105° F. to 115° F., for a time sufficient to give at least 3 weight percent conversion to 950° F. minus boiling range hydrocarbons but without producing an asphalt having a positive Oliensis, and oxidizing resulting asphalt stock into a coating asphalt having a softening point of 220° F. to 230° F. and a penetration at 77° F. in the range of 16 to 24.

3,598,717
METHOD FOR LIQUEFYING COAL
George R. Sunagel, Lincolnwood, Richard S. Corey, Rolling Meadows, Frederick J. Riedl, Arlington Heights, and William K. T. Gleim, Island Lake, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed June 25, 1968, Ser. No. 739,838
Int. Cl. C10g 1/00
U.S. Cl. 208—8 5 Claims

A two-stage solvent extraction method for converting solid coal into liquid coal extract. The first stage uses the conventional solvents, such as polyaromatic hydrocarbons, alkylnaphthalenes, anthracene oil, or partially hydrogenated aromatics as for instance, Tetralin. The liquefied coal stripped of the solvent is then extracted with a ketone to produce a hydrogen-rich extract fraction and a hydrogen-lean extract phase. The hydrogen-rich fraction is recovered and used as a source for valuable chemicals and liquid fuels. The hydrogen-lean fraction may be used for plant fuel and/or as a source for additional hydrogen through conversion by the "water-gas" reaction.



3,598,718
SOLVENT EXTRACTION OF COAL
William K. T. Gleim, Island Lake, Richard S. Corey, Rolling Meadows, Frederick J. Riedl, Arlington Heights, and George R. Sunagel, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Continuation-in-part of application Ser. No. 739,838, June 25, 1968. This application Aug. 18, 1969, Ser. No. 850,987
Int. Cl. C10g 1/00
U.S. Cl. 208—8 14 Claims

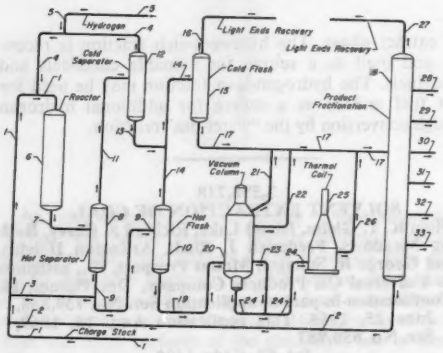


Coal is converted to liquid products utilizing a two-stage solvent extraction process wherein the liquid coal products are separated from unreacted coal and ash without requiring filtration. The coal is first contacted with conventional coal solvents, such as tetrahydronaphthalene under hydrogen pressure; the solvent is removed via fractionation; and hydrogen-rich coal components produced are recovered free of particulate matter by solvent extraction with a light aromatic or ketone solvent.

3,598,719
HYDROTREATING CATALYST AND PROCESS
Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Aug. 5, 1969, Ser. No. 847,540
Int. Cl. C10g 13/02
U.S. Cl. 208—59 9 Claims

A catalyst comprising a crystalline zeolitic molecular sieve component substantially free of any catalytic metal or metals, an alumina-containing gel component, a Group VI hydrogenating component and Group VIII hydrogenating component, and processes using said catalyst.

3,598,720
DESULFURIZATION AND CONVERSION OF HYDROCARBONACEOUS BLACK OILS WITH MAXIMUM PRODUCTION OF DISTILLABLE HYDROCARBONS
Frank Stolfa, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Dec. 12, 1968, Ser. No. 783,181
Int. Cl. C10g 23/00
U.S. Cl. 208—89 5 Claims

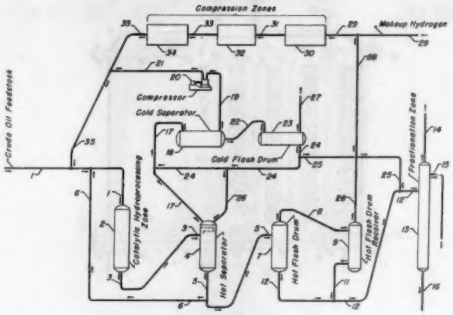


A process for converting asphaltene-containing hydrocarbonaceous black oils into lower-boiling, normally liquid hydrocarbon products without substantial yield loss to asphaltic residuum. The process involves the integration of a thermal cracking coil and fixed-bed catalytic hydrogenation and desulfurization, and is especially applicable to sulfurous charge stocks containing less than 150 p.p.m. of metallic contaminants, and more than about 10.0% by volume of non-distillables. The charge stock is initially subjected to fixed-bed catalytic desulfurization and hydrogenation. A high-boiling concentrate is then subjected to a non-catalytic, thermal cracking reaction zone or coil, and unconverted asphaltics are recycled to the fixed-bed reaction zone for hydrogenation.

3,598,721
GASOLINE PRODUCING PROCESS
Vladimir Haensel, Hinsdale, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed June 2, 1969, Ser. No. 829,770
Int. Cl. C10g 23/00
U.S. Cl. 208—89 7 Claims

High octane gasoline blending components are produced from catalytically-cracked cycle oils. A substantially sulfur- and nitrogen-free cycle oil is initially hydrogenated in contact with a non-acidic catalytic composite, and the hydrogenated product effluent is subjected to non-catalytic, hydrogenative thermal cracking.

3,598,722
CATALYTIC HYDROPROCESSING OF A PETROLEUM CRUDE OIL FEEDSTOCK
Don B. Carson, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Mar. 10, 1969, Ser. No. 805,705
Int. Cl. C10g 13/00
U.S. Cl. 208—108 3 Claims



A petroleum crude oil feedstock is catalytically hydroprocessed into more valuable products while, simultaneously, recovery and reuse of hydrogen is achieved by means of a combination process including the steps of catalytic hydroprocessing, separation, hydrogen recovery, and fractionation.

3,598,723
HYDROCARBON HYDROPROCESSING
Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 825,084, May 15, 1969. This application June 30, 1969, Ser. No. 837,924
Int. Cl. C10g 13/02
U.S. Cl. 208—111 8 Claims

A process for hydrotreating (hydroprocessing) hydrocarbons and mixtures of hydrocarbons utilizing a catalytic composite of a porous carrier material, a rhenium component and a tin component, in which process the chemical consumption of hydrogen is effected. A specific example of one such catalyst is a composite of a crystalline aluminosilicate, particularly faujasite, a rhenium component, and a tin component. Specific hydroprocesses are directed toward the hydrogenation of aromatic nuclei, hydrocracking, the ring-opening of cyclic hydrocarbons, desulfurization, denitrification and hydrogenation.

3,598,724
PRODUCTION OF PROPANE AND BUTANES
Bernard F. Mulaskey, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Continuation-in-part of application Ser. No. 742,321, July 3, 1968, now Patent No. 3,487,007, which is a continuation-in-part of application Ser. No. 645,855, June 8, 1967, now Patent No. 3,399,132, which in turn is a continuation-in-part of application Ser. No. 568,536, July 28, 1966, now abandoned. This application Sept. 15, 1969, Ser. No. 858,128
Int. Cl. C01b 33/28; C07c 9/00
U.S. Cl. 208—111 9 Claims

A hydrocarbon feed boiling above 100° F. is converted to high yields of C_3–C_4 hydrocarbons by contact with a

catalyst comprising mordenite, thoroughly admixed with an amorphous porous inorganic oxide containing nickel, or compounds thereof, and tin, or compounds thereof, at hydrocracking conditions sufficiently severe to convert at least 30 percent of the feed to products boiling below 100° F.

3,598,725

HYDROCARBON DESULFURIZATION WITH A RHENIUM CATALYST ON SILICEOUS CARRIER MATERIAL

Lee Hilfman, Prospect Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,050
Int. Cl. C10g *23/02*
U.S. Cl. 208—216 5 Claims

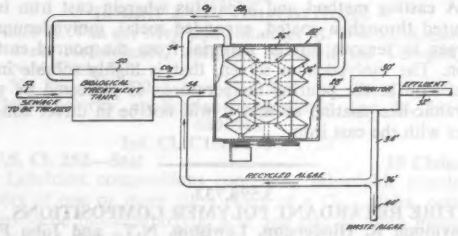
A catalyst for effecting the desulfurization of sulfurous, hydrocarbonaceous charge stocks. The catalyst comprises a composite of a siliceous carrier material combined with rhenium sulfide. The rhenium sulfide is present in an amount of from 0.01% to about 2.0% by weight, calculated as the elemental metal, and is combined with one or more sulfided metallic components from Groups VI–B and the Iron-group. The use of the rhenium component imparts additional hydrogenation activity to the catalyst.

3,598,726

WATER TREATMENT APPARATUS AND METHOD

Fredrick M. Welch, Oconomowoc, Wis., assignor to Autotrol Corporation, Glendale, Wis.

Filed Aug. 27, 1968, Ser. No. 755,616
Int. Cl. C02c *1/04*
U.S. Cl. 210—3 7 Claims



An apparatus for and method of removing nutrients such as nitrates, phosphates or carbonaceous materials from water. The water to be treated is contacted by rotatings disks having tapered surfaces. Algae are supplied to the water and are picked up by the rotating disks, being supported by the tapered surfaces of the disks. The algae on the disks are exposed to the combined effects of sunlight, either natural or artificial, and to an atmosphere of carbon dioxide (CO_2). The algae remove the nutrients from the water, and reduce the carbon dioxide present in the atmosphere above the liquid to oxygen (O_2).

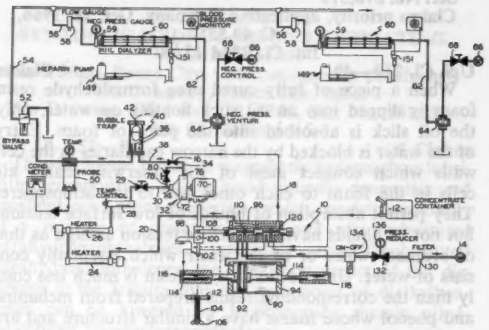
3,598,727

ARTIFICIAL KIDNEY

Charles B. Willock, 16222 SE. Oatfield Road, Milwaukie, Oreg. 97222

Filed Apr. 7, 1969, Ser. No. 814,078
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—22 10 Claims

In an artificial kidney, a dialysate concentrate liquid and heated tap water are fed separately by pumps in fixed proportions to a mixing venturi where the water and liquid are combined to form a dialysate solution. In order to remove from the dialysate solution a desired portion of air which has been introduced therein from the water, the heated water is passed through a positive displacement



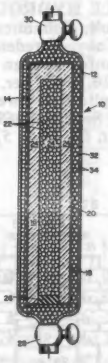
pump having a restricted orifice bypass line before it arrives at the mixing venturi. This causes consolidation of the air from small to large bubbles which are removed by a bubble trap. The resulting deaerated solution is then advanced through a header to branch lines to dialyzers.

3,598,728

MEMBRANE-MODERATED SEPARATION APPARATUS AND PROCESS

Harris J. Bixler, Lexington, and Shmuel Sternberg, Hyde Park, Mass., assignors to Amicon Corporation, Lexington, Mass.

Filed June 16, 1969, Ser. No. 833,419
Int. Cl. B01d *13/00, 31/00*
U.S. Cl. 210—22 17 Claims



A novel separative apparatus comprising a separation zone whereby (1) an immobilized liquid phase is separated from a mobile liquid phase by a semi-permeable membrane and wherein said mobile liquid phase is a carrier liquid for a plurality of compounds, at least one of which compounds interacts, chemically or physically, with the semi-permeable membrane and/or the immobilized liquid phase and is thereby retarded in its progress through the reaction zone.

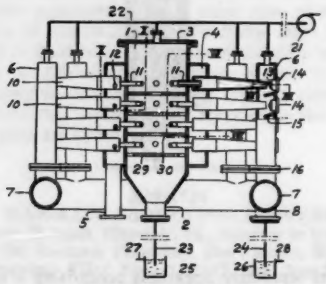
3,598,729
METHOD OF REMOVING OIL SLICKS FROM WATER SURFACES
Heinz Baumann, 3 Zuckerfabrikstrasse, Frankenthal, Pfalz, Germany
No Drawing. Continuation-in-part of application Ser. No. 678,214, Oct. 26, 1967. This application Nov. 13, 1969, Ser. No. 876,579
Claims priority, application Germany, Oct. 28, 1966, C 40,551
Int. Cl. B01d *15/00*
U.S. Cl. 210—40 4 Claims

When a piece of fully cured urea formaldehyde resin foam is dipped into an oil slick floating on water, only the oil slick is absorbed into the piece of foam. Entry of the water is blocked by the narrow capillaries in the cell walls which connect most of the otherwise sealed air cells in the foam to each other and to the atmosphere. They permit absorption of liquids of low surface tension, but not of liquids having a surface tension as high as that of ordinary water or of sea water which essentially consists of water. Urea formaldehyde resin is much less costly than the corresponding resins prepared from melamine and phenol whose foams have a similar structure and are similarly effective.

3,598,730
PROCESS OF FLOCCULATING SILICA WITH A CATIONIC XANTHOMONAS GUM ETHER
Robert Nordgren and Harold A. Wittcoff, Minneapolis, Minn., assignors to General Mills, Inc.
No Drawing. Original application Apr. 15, 1968, Ser. No. 721,143, now Patent No. 3,505,310. Divided and this application Dec. 10, 1969, Ser. No. 884,034
Int. Cl. B01d *21/01*
U.S. Cl. 210—54 3 Claims

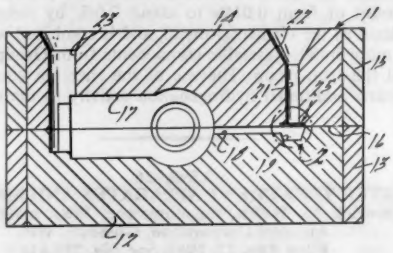
A cationic Xanthomonas microbial gum produced by the reaction of a quaternary ammonium compound and a Xanthomonas microbial gum derived from the aerobic fermentation of the bacterium Xanthomonas. The cationic Xanthomonas microbial gum can be suitably used as a flocculant.

3,598,731
MULTIPLE HYDROCYCLONE
Rune Helmer Frykhult, Johanneshov, and Karl Folke Olof Jakobsson, Taby, Sweden, assignors to Aktiebolaget Celleco, Tumba, Sweden
Filed Nov. 20, 1969, Ser. No. 878,295
Claims priority, application Sweden, Nov. 20, 1968, 15,742/68; Sept. 8, 1969, 12,350/69
Int. Cl. B04c *5/28*
U.S. Cl. 210—94 18 Claims



A central vessel is surrounded by groups of hydrocyclones arranged one above another, each hydrocyclone forming an elongated vortex chamber having an accept end provided with an inject inlet and an axial accept outlet, each chamber also having an opposed reject end provided with an axial reject outlet. The central vessel forms an accept chamber common to and communicating with the vortex chambers by way of their accept outlets. Means are provided at the reject ends of the vortex chambers for collecting the reject from the reject outlets, the collecting means including means in the vicinity of the reject outlets for enabling detection of a change in the reject flow.

3,598,732
COATED MOLYBDENUM MESH SCREEN FOR FERROUS METAL CASTING MOLDS
Daniel W. Foster, Walled Lake, and William G. Scholz, Ann Arbor, Mich., assignors to American Metal Climax, Inc.
Filed Oct. 14, 1969, Ser. No. 866,353
Int. Cl. B01d *39/10*
U.S. Cl. 210—499 6 Claims



A casting method and apparatus wherein cast iron is poured through a coated, expanded metal, molybdenum screen to remove foreign material from the poured cast iron. The molybdenum screen, that is highly soluble in cast iron at the pouring temperatures, is protected by a ceramic-like coating so that it will not be in direct contact with the cast iron.

3,598,733
FIRE RETARDANT POLYMER COMPOSITIONS
Raymond R. Hindersinn, Lewiston, N.Y., and John F. Porter, Durham, N.C., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Original application June 7, 1968, Ser. No. 735,184, now Patent No. 3,530,083, dated Sept. 22, 1970. Divided and this application Dec. 31, 1969, Ser. No. 889,680
Int. Cl. B27k *3/00;* C09d *5/18;* C09k *3/28*
U.S. Cl. 252—8.1 7 Claims

A fire retardant composition can be formed by use of a fire retarding agent of an arylhaloalkylalkyl phosphonate in combination with an organo halide compound. A typical example is cresyl-2-bromoethylmethyl phosphonate in combination with chlorinated paraffin.

3,598,734
HIGH TEMPERATURE GREASE
Arthur C. Borg, Chicago, Ill., and Stephen J. Zajac, Whiting, Ind., assignors to Standard Oil Company, Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 178,539, Mar. 9, 1962, which is a continuation-in-part of application Ser. No. 175,871, Feb. 21, 1962. This application Mar. 4, 1969, Ser. No. 804,263
Int. Cl. C10m *5/26*
U.S. Cl. 252—28 6 Claims

A grease of high temperature and mechanical stability is prepared with a lubricant base thickened to grease

consistency with a reaction product of an aromatic polyisocyanate and a boric acid in combination with finely divided silica.

3,598,735
POLYALKYLENE GLYCOL MERCAPTOSUCCINIMIDES DISPERSANTS FOR LUBRICANT FLUIDS
Ting-I Wang, Fullerton, Calif., assignor to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed Oct. 8, 1968, Ser. No. 765,994
Int. Cl. C10m *1/38*
U.S. Cl. 252—47.5 **1 Claim**

A new class of compounds and a series of novel lubricant compositions are disclosed. Polyalkylene glycol mercaptosuccinimides which are useful as dispersants in polyalkylene glycol lubricant fluids as sludge dispersants and lubricant fluid compositions including such mercaptosuccinimides are described.

3,598,736
POLYALKYLMETHACRYLATES AS POUR POINT DEPRESSANTS FOR LUBRICATING OILS
Pieter H. Van der Meij and Arnold A. Buitelaar, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,777
Claims priority, application Great Britain, Aug. 30, 1967, 39,700/67
Int. Cl. C10m *1/28, 1/26*
U.S. Cl. 252—56 **6 Claims**

Pour points of lubricating oils with widely varying viscosities are depressed by adding thereto small amounts of novel oil soluble polyalkylmethacrylates.

3,598,737
LUBRICANT COMPOSITIONS
Pieter H. Van der Meij and Johannes M. Wortel, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Apr. 17, 1969, Ser. No. 817,145
Claims priority, application Netherlands, Apr. 26, 1968, 6805941
Int. Cl. C10m *1/26, 1/28*
U.S. Cl. 252—56R **10 Claims**

Lubricant compositions containing oil-soluble copolymers of one or more alkyl esters of a C_{3-5} alpha, beta-vinylidene monocarboxylic acid and one or more monohydroxy alkyl esters of a C_{3-5} alpha, beta-vinylidene monocarboxylic acid, wherein the average number of the carbon atoms in the $CH_3—(CH_2)_n—$ groups present in the alkyl side chains, *n* being at least 9, is from 12.5 to 14.3, have improved pour points, viscosity indices and dispersant properties.

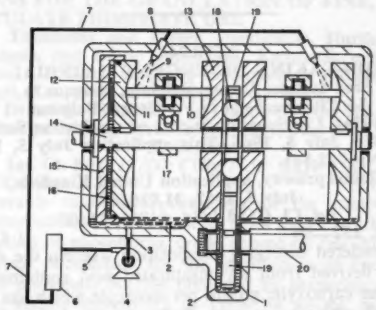
3,598,738
OIL COMPOSITIONS CONTAINING ETHYLENE COPOLYMERS
Charles B. Biswell, Woodstown, N.J., Mark Stanley Fawcett, Chadds Ford, Pa., and Andrew Mitchell, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 581,448, Sept. 23, 1966. This application Dec. 19, 1968, Ser. No. 785,329
Int. Cl. C01m *1/18*
U.S. Cl. 252—59 **7 Claims**

This invention relates to mineral oil compositions comprising a neutral, non-volatile, mineral oil and an effective amount of a viscosity index improver selected from a limited class of oil-soluble, substantially linear, ethylene, hydrocarbon copolymers containing 25 to 55 weight percent polymerized ethylene units and having a pendent index of 18 to 33, an average pendent size not exceeding 10 carbon atoms, an average chain length of 2,700 to 8,800 carbon atoms and an inherent viscosity of 0.7 to 1.8 as measured on a 0.1 weight percent solution in tetrachloroethylene at 30° C.

3,598,739
SYNTHETIC HYDROCARBON LUBRICATING COMPOSITION
Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 20, 1969, Ser. No. 801,190
Int. Cl. C10m *1/16*
U.S. Cl. 252—59 **6 Claims**

This disclosure concerns a synthetic hydrocarbon lubricating composition, having good viscosity properties and excellent pour point properties, which consists essentially of a mixture of dialkylbenzenes and alkyl-substituted tetrahydronaphthalenes, preferably trialkyl-substituted tetrahydronaphthalenes. An important aspect of the disclosure is the feature that the pour point of dialkylbenzenes can be lowered by incorporating therein alkyl-substituted tetrahydronaphthalenes.

3,598,740
TRACTION DRIVE TRANSMISSION CONTAINING PARAFFINIC OIL AS LUBRICANT
Irl N. Duling, West Chester, David S. Gates, Swarthmore, and Thomas D. Newington, Broomall, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed Nov. 1, 1967, Ser. No. 679,851
Int. Cl. C09k *3/00;* **F16h** *15/08*
U.S. Cl. 252—73 **7 Claims**



A power transmission system comprises a traction drive transmission and, as a lubricant, a hydrocarbon base stock, comprising a paraffinic oil containing less than 1% by weight of aromatics and having an ultraviolet absorptivity at 260 millimicrons of less than 0.5.

3,598,741
ACID COMPOUND FOR METAL SURFACE
Shozo Kanno, Kobe, Japan, assignor to Chugai Kasei Co., Ltd., Osaka, Japan
No Drawing. Filed Oct. 7, 1969, Ser. No. 864,535
Claims priority, application Japan, Oct. 7, 1968, 43/73,022, 43/73,023
Int. Cl. C23f *1/00;* **C23g** *1/02*
U.S. Cl. 252—79.3 **11 Claims**

Compositions having suitable viscosities for the cleaning and etching of metals comprising hydrofluoric acid, mag-

nesium and at least one acid or salt of an acid selected from the group consisting of nitric acid, phosphoric acid, sulfuric acid and sulfonic acid.

3,598,742
STABLE FOAMED MATERIALS
Saunders Eliot Jamison, Summit, and Gene Henry Anthony, Whitehouse Station, N.J., assignors to Celanese Corporation of America, New York, N.Y.
No Drawing. Continuation of application Ser. No. 543,083, Apr. 18, 1966. This application Jan. 9, 1970, Ser. No. 3,554
Int. Cl. C11d *17/04*
U.S. Cl. 252—91 10 Claims

Stable, open-celled, foamed compositions are prepared by combining a fibrous material with a wetting agent, a water-thickening substance and a film of a water-insoluble polymer having a glass transition temperature of less than 50° C.

3,598,743
PREPARATION OF GRANULAR DETERGENT COMPOSITIONS FOR AUTOMATIC DISHWASHERS
Kenneth Coates, Newcastle upon Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed July 23, 1969, Ser. No. 844,191
Claims priority, application Great Britain, July 25, 1968, 35,497/68
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 5 Claims

Granular dishwashing detergent compositions are prepared by dry-mixing sodium tripolyphosphate and chlorinated trisodium phosphate, spraying aqueous sodium silicate thereon to form agglomerated granules, and cooling by passing cold air at a temperature not exceeding 75° F. through a bed of the granules.

3,598,744
NON-CAKING DETERGENT MATERIAL
Fred Smeets, Tienen, Belgium, assignor to La Citrique Belge N.V., Tienen, Belgium
No Drawing. Continuation-in-part of application Ser. No. 563,816, July 8, 1966. This application July 5, 1968, Ser. No. 742,541
Claims priority, application United Kingdom, July 5, 1967, 31,010/67
Int. Cl. C11d *1/14, 3/065, 11/00*
U.S. Cl. 252—99 1 Claim

A powdered detergent composition wherein the detergent is derived from an unsaturated acid containing at least four carboxylic groups per molecule which has been esterified with one or more hydroxy containing organic compounds, e.g., alcohols, is produced by mixing the detergent composition with water to form a paste wherein auto-heating of the paste occurs thereby drying the product, the dried product is thereafter comminuted to form a powder.

3,598,745
SUBSTITUTED 4,7-METHANOINDENES PERFUME COMPOSITIONS
Morris Dunkel, Paramus, N.J., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Original application Dec. 16, 1965, Ser. No. 514,373. Divided and this application Oct. 31, 1968, Ser. No. 772,409
Int. Cl. C11b *9/00*; A61k *1/00*
U.S. Cl. 252—522 4 Claims

Perfume composition containing as an olfactory ingredient a hexahydro or octahydro-4,7-methanoindene substituted in the 5 or 6 position with a carboxylate of an alpha, beta-unsaturated monocarboxylic acid.

3,598,746
COSMETIC SOAP BAR
Thaddeus John Kaniecki, La Grange, Thomas John Hassapis, Chicago, and Irwin Liebman, Chicago, Ill., assignors to Armour-Dial, Inc., Chicago, Ill.
No Drawing. Filed May 9, 1969, Ser. No. 823,506
Int. Cl. C11d *9/26, 9/48*
U.S. Cl. 252—122 7 Claims

Cosmetic soap compositions based upon regular soap stock which contain free fat or fatty acids, low molecular weight alkylene glycols, or polyalkylene glycols are disclosed. The alkylene glycol component overcomes the lather depressing characteristics of the free fat or fatty acids. The polyalkylene glycol component imparts a smooth feeling to the skin. Other materials such as germicides, perfumes and dyes can be added to the basic components in the preparation of soap bars.

3,598,747
ALCOHOL MIXTURES ADAPTED FOR USE IN MAKING DETERGENT SULFATES
William R. Axtell and Earl G. De Witt, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 558,237, June 17, 1966, which is a continuation-in-part of application Ser. No. 277,078, May 1, 1963. This application Jan. 13, 1970, Ser. No. 2,670
Int. Cl. C11d *1/14, 3/065*
U.S. Cl. 252—182 5 Claims

Higher alcohol compositions are disclosed which are primarily mixtures of myristyl, palmityl and stearyl alcohols containing small quantities of alcohols of lower molecular weight. These compositions can be used in making high foaming mixtures of alkyl sulfates.

3,598,748
ARYLDIAMINE AND ALDEHYDE REACTION PRODUCT CURING AGENTS FOR URETHANE RESINS
Frank N. Hirosawa, Monterey Park, Calif., assignor to Furane Plastics Incorporated, Los Angeles, Calif.
No Drawing. Continuation-in-part of application Ser. No. 358,931, Apr. 10, 1964. This application Nov. 15, 1967, Ser. No. 683,161
Int. Cl. C08g *51/84*
U.S. Cl. 252—182 12 Claims

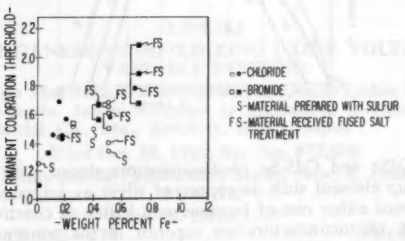
A curing agent and hardener specifically for urethane resin compositions, is made by processing 4,4'-methylene bis(2-chloroaniline) or 3,3'-dichlorobenzidine, or mixtures thereof, with specific active aldehyde compounds, which agent is a liquid, readily dispersed in a wide variety of urethane resin compositions, and resulting in room temperature curing of said urethane compositions.

3,598,749
PRODUCTION OF EPOXIDE COMPOSITIONS
Chao-Shing Cheng, Williamsville, Francis E. Evans, Hamburg, Herman Stone, Tonawanda, and Harold Kaler, Niagara Falls, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed May 23, 1969, Ser. No. 827,142
Int. Cl. C08f *45/36*; C08g *51/36, 51/74*
U.S. Cl. 252—182 15 Claims

Disclosed are uncured polyepoxide resin compositions comprising a polyepoxide containing oxirane groups together with a methyl-norbornane-2,3-dicarboxylic anhydride as curing agent, preferably in the presence of an accelerating agent, such as a tertiary amine or an organo metallic compound, and cured polyepoxide resins produced therefrom. Also disclosed is production of novel liquid anhydride compositions comprising a mixture of 1- and 5-methyl-norbornane-2,3-dicarboxylic anhydrides present in a weight ratio no greater than about 3:1, at least about 40 weight percent of said 5-methyl isomers of

said mixture being of exo-configuration, by heating an anhydride mixture comprising endo-1- and 5-methyl-5-norbornene 2,3-dicarboxylic anhydrides at an elevated temperature in the presence of hydrogen. The polyepoxide compositions disclosed are substantially less volatile during curing at elevated temperatures, and cured resins produced therefrom exhibit superior mechanical properties and are of lighter color as compared with cured resins produced from polyepoxide compositions derived from known cycloaliphatic anhydride curatives. The liquid novel anhydride compositions disclosed are storage stable for extended periods of time without deposition of solids and change of color, and are stable to changes in temperature below distillation temperatures.

3,598,750
PHOTOCHROMIC IMAGE DEVICE
William Phillips, Princeton, N.J., assignor to RCA Corporation
Filed Nov. 17, 1969, Ser. No. 877,236
Int. Cl. H01j *1/54*
U.S. Cl. 252—300 **10 Claims**



An image display and storage device has a photochromic image screen consisting of sodalite having the basic chemical composition $Na_6Al_6Si_6O_{24}\cdot 2NaX$ wherein X is at least one halogen selected from the group consisting of chlorine, bromine and iodine and wherein the sodalite contains from at least 50 parts per million of iron up to the solubility limit of iron in the sodalite. The sodalite is annealed in a reducing atmosphere to produce its photochromic properties. Such an image screen darkens upon exposure to ultraviolet light or cathode ray excitation.

An especially high contrast ratio image screen can be attained utilizing sodalite doped with iron which is treated by heating the sodalite in a fused alkali halide salt bath.

3,598,751
PROCESS FOR PREPARING BIVALENT METAL HALOPHOSPHATE COMPOUNDS AND PRODUCTS OBTAINED THEREBY
Daniel J. Frese, Webster Groves, and Ronald S. Schreiber and Hugh C. Bertsch, St. Louis, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.
No Drawing. Continuation of application Ser. No. 610,772, Jan. 23, 1967. This application Feb. 9, 1970, Ser. No. 9,103
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4P **5 Claims**

Activated bivalent metal halophosphate compounds having the apatite crystal structure are prepared by coprecipitation. Two or more total solutions, the sum of which contain all the ions needed in the final product, are mixed in approximately stoichiometric proportions. A brief firing converts this intermediate into a halophosphate phosphor of the apatite type.

3,598,752
ULTRAVIOLET EMITTING CATHODOLUMINESCENT MATERIAL
Thomas E. Sisneros, Fort Wayne, and Joseph A. Davis, New Haven, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
No Drawing. Filed Apr. 14, 1967, Ser. No. 630,824
Int. Cl. C09k *1/54, 1/04*
U.S. Cl. 252—301.4 **3 Claims**

The invention herein provides a luminescent phosphor for use in cathode ray tubes or the like which is excitable by an electron beam and will emit in the ultraviolet spectral regions and having the general composition

$$Ca_3Si_2O_7{:}Pb$$

Predetermined amounts of $CaCO_3$, SiO_2, and PbF_2 are fired between 1,300 to 1,450° C. for 1 to 10 hours to produce the phosphor.

3,598,753
ZINC SULFIDE PHOTOLUMINESCENT COMPOSITION
Stanley M. Poss, Towanda, Pa., assignor to Sylvania Electric Products Inc.
No Drawing. Filed May 7, 1969, Ser. No. 822,740
Int. Cl. C09k *1/12*
U.S. Cl. 252—301.6S **4 Claims**

A photoluminescent phosphor that emits yellow light consisting essentially of a predominate portion zinc sulfide as the host and as an activator the following ingredients in percent by weight of the zinc sulfide: from about 0.001% to about 0.05% of copper, from about 0.003% to about 0.11% by weight of manganese and from about 0.66% to about 2.6% of zinc.

3,598,754
PROCESS FOR THE MANUFACTURE OF SUSPENSIONS FOR THE GRANULATION OF FINE, PARTICULATE PHOSPHATE ORE
Ursus Thümmler and Dieter Mandelkow, Hurth, near Cologne, and Bruno Przybylski, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany
No Drawing. Filed May 3, 1968, Ser. No. 726,603
Claims priority, application Germany, May 12, 1967, K 62,280
Int. Cl. B01j *13/00;* **C09c** *1/56;* **C21b** *1/08*
U.S. Cl. 252—313R **7 Claims**

Sprayable suspensions consisting of the components clay, electrofilter dust originating from the electrothermal production of phosphorus, crude phosphate fine dust and condensed phosphates, for the granulation of fine, particulate phosphate ore are produced by preparing a clay sludge, adding thereto 0.2 to 1.0% by weight, referred to dry clay, of one or more condensed alkali metal phosphates and adding the clay sludge so made to a suspension produced from the further suspension components with the resultant formation of a final suspension with a total solid matter content between 45 and 65% by weight, and with an electrofilter dust content between 15 and 30% by weight and with a clay content between 8 and 30% by weight, the electrofilter dust content and the clay content of the final suspension being referred to its total solid matter content.

3,598,755
FOAM CONTROL AGENTS
John W. McBroom, Saddlebrook, N.J., and Barry B. Rein, Riverdale, N.Y., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed July 5, 1968, Ser. No. 742,479
Int. Cl. B01d
U.S. Cl. 252—321 **10 Claims**

Foaming during acidulation of phosphate rock to produce wet-process phosphoric acid is greatly reduced by

addition of a reagent comprising a mixture of alcohol of 16 or more carbons and a butylene oxide capped ethoxylated alcohol made from an alcohol of 10 or more carbons.

3,598,756
PHOSPHATE- AND CHROMATE-FREE CORROSION INHIBITOR
Allyn H. Heit, Mount Holly, N.J., assignor to Sybron Corporation, Rochester, N.Y.
No Drawing. Filed Sept. 4, 1968, Ser. No. 757,454
Int. Cl. C23f *11/16*
U.S. Cl. 252—389 **12 Claims**

Lignosulfonate base, chromate- and phosphate-free corrosion inhibitor for the treatment of water. The inhibitor consists of 50%–90% of a lignosulfonate product, 5%–20% of water soluble, polyvalent metal salt, and .5%–10% of mercaptobenzothiozote, dibutylthiourea or mixtures of the two. The preferred metal salt is zinc sulfate monohydrate.

3,598,757
CYCLIC BORATE ANTIOXIDANT MIXTURE
Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 2, 1968, Ser. No. 780,600
Int. Cl. B01j *1/16*
U.S. Cl. 252—400 **5 Claims**

Synergistic mixture of a cyclic borate containing one nitrogen in the ring and at least one of a hydroxyphenone, an N-hydroxyphenyl-benzotriazole and a salicylic acid ester. This mixture is used as an additive to stabilize plastic from deterioration due to weathering, oxidation, heat, etc.

3,598,758
CATALYST COMPOSITION AND PROCESS FOR OXYCHLORINATING HYDROCARBONS
Shunichi Koyanagi, Kinya Ogawa, and Fumio Akiya, Niigata-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
No Drawing. Filed May 21, 1968, Ser. No. 730,927
Claims priority, application Japan, May 23, 1967, 42/32,745
Int. Cl. C07c *17/10*
U.S. Cl. 252—429 **9 Claims**

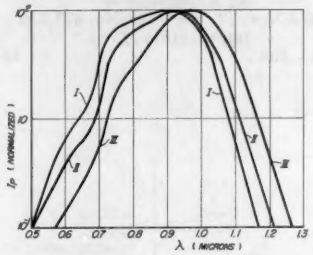
Catalyst suitable for the oxychlorination of aliphatic hydrocarbons. The catalyst has superior thermal stability, exhibits long lasting activity and essentially consists of three ingredients in defined proportions, namely of a mixture of an organic copper compound, an alkali metal chloride and an ammonium salt, deposited on a porous carrier.

A method for depositing the three ingredients on the porous carrier is also part of the invention.

3,598,759
METHOD FOR IMPROVING THE CRUSHING STRENGTH AND RESISTANCE TO ABRASION OF A CATALYST
Ralph J. Bertolacini, Chesterton, Ind., assignor to Standard Oil Company, Chicago, Ill.
No Drawing. Continuation-in-part of abandoned application Ser. No. 583,407, Sept. 30, 1966. This application Feb. 11, 1969, Ser. No. 798,437
Int. Cl. B01j *11/78*
U.S. Cl. 252—442 **7 Claims**

The method comprises incorporating silica into the catalyst after the catalyst has been formed into desired shapes to form a silica-impregnated catalyst, drying and calcining in air the silica-impregnated catalyst. The silica is impregnated therein to provide an amount between about 1 weight percent and about 20 weight percent, based upon the weight of the catalyst.

3,598,760
CdSe OR CdS-Se PHOTOCONDUCTORS DOPED WITH A I_B ELEMENT AND EITHER BROMINE OR IODINE
Shigeaki Nakamura and Tadao Nakamura, Kawasaki-shi, and Tadao Kohashi, Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 21, 1968, Ser. No. 714,898
Claims priority, application Japan, Mar. 31, 1967, 42/20,847
Int. Cl. G03g *5/02*; H01i *13/00*; C09c *1/10*
U.S. Cl. 252—501 **6 Claims**



CdSe and CdS-Se photoconductors doped with a I_B group element such as copper or silver as activator and at least either one of bromine and iodine as coactivator. Such photoconductors are superior to the conventional CdSe and CdS-Se ones doped with chlorine as coactivator in respect of the sensitivity especially in the longer wavelength range.

3,598,761
CONDUCTOR COMPOSITIONS FOR MICROCIRCUITRY
John M. Woulbroun, Lynnfield, and Daniel W. Mason, Peabody, Mass., assignors to Owens-Illinois, Inc.
Filed Oct. 6, 1969, Ser. No. 863,875
Int. Cl. H01b *1/02*; B44d *1/02*
U.S. Cl. 252—514 **7 Claims**

A class of conductive compositions for interconnecting parts in thick film circuits is disclosed wherein conductor paths are formed between particles of micron size which are coated with noble metal over a core with contrasting properties whereby after firing, a solderable adherent conductive body is formed which has the desirable properties of prior-art conductors of the palladium-gold type, but which contain a substantially lesser noble metal content. "Mock-metal" particles such as palladium over alumina and gold over copper are described.

3,598,762

VANADIUM OXIDE SEMICONDUCTORS AND METHOD OF MANUFACTURING SAME

Hisao Futaki, Musashino-shi, and Takeshi Shimoda, Hachioji-shi, Japan, assignors to Kabushiki Kaisha Hitachi Seisakusho, Tokyo, Japan

Continuation of abandoned application Ser. No. 484,510, Aug. 24, 1965, which is a continuation-in-part of application Ser. No. 266,245, Mar. 19, 1963. This application Sept. 21, 1967, Ser. No. 701,021

Claims priority, application Japan, Mar. 22, 1962, 37/10,639

Int. Cl. H01b *1/06;* H01c

U.S. Cl. 252—518 35 Claims

A thermistor having an abrupt change in a negative temperature coefficient of electrical resistance in a specific temperature range from 65 to 70° C., which comprises a sintered body composed of a semiconductive oxide substance and a plurality of crystalline particles of V_2O_4 suspended in and enclosed by said oxide substance. This specification also discloses methods for producing thereof which comprises the steps of reducing a mixture of V_2O_5 and other oxide at about 400° C. and sintering the reduced mixture at 1000–1300° C.

3,598,763

MANGANESE-MODIFIED ZINC OXIDE VOLTAGE VARIABLE RESISTOR

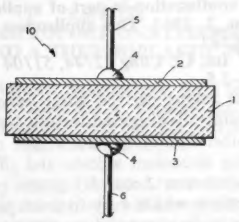
Michio Matsuoka, Takeshi Masuyama, and Yoshio Iida, Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Oct. 30, 1969, Ser. No. 872,590

Claims priority, application Japan, Nov. 8, 1968, 43/82,125

Int. Cl. H01b *1/06*

U.S. Cl. 252—518 10 Claims



A voltage variable resistor ceramic composition consisting essentially of zinc oxide and, as an additive, manganese oxide. The manganese-modified zinc oxide voltage variable resistor has improved voltage nonlinear properties due to the further addition of barium oxide, strontium oxide, lead oxide, uranium oxide, cobalt oxide, bismuth oxide and calcium oxide.

3,598,764

MATERIAL FOR THE MANUFACTURE OF HIGH-TEMPERATURE THERMISTORS

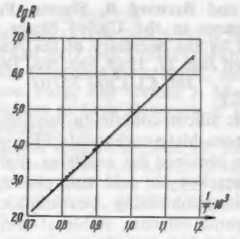
Nikolai Trofimovich Plaschinsky, Ulitsa Pribytkovskaya, and Iosif Teodorovich Sheftel, prospekt Morisa Toreza, 28, kv. 105, both of Leningrad, U.S.S.R.

Filed Dec. 9, 1968, Ser. No. 782,229

Int. Cl. H01b *1/06*

U.S. Cl. 252—520 3 Claims

A material for the manufacture of high-temperature thermistors operating at temperatures of up to 1,000° C., comprising cerium dioxide as the basic component and zirconium dioxide as the additive, said method making it possible to produce thermistors having high and stable electric parameters.



3,598,765

PROCESS FOR POLYMERIZING CYCLIC OXIDES WITH A CATALYST CONSISTING OF AN ORGANOZINC COMPOUND AND ANOTHER MATERIAL

Marco A. Achon, Chester, Pa., assignor to The General Tire and Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 170,235, Jan. 31, 1962. This application May 4, 1967, Ser. No. 636,003

Int. Cl. C08j *23/14*

U.S. Cl. 260—2EP 10 Claims

A process is disclosed for making polyethers which comprises mixing under anhydrous non-oxidizing conditions (A) at least one compound of the formula ZnR_2 in which each R is a monovalent hydrocarbon radical, at least one R being non-aromatic, from about 0.05 to about 1.5 mols per mol of (A) of (B) of at least one compound selected from the group consisting of primary aromatic amines, amides, cycloalkadienes of from 5 to 6 carbon atoms and secondary amines composed of at least one nitrogen atom, from about 2 to about 14 carbon atoms per nitrogen atom and at least 6 total hydrogen atoms per nitrogen atom, any remaining atoms in the secondary amines being selected from the group consisting of ethereal oxygen atoms, hydroxyl oxygen atoms and thioethereal sulfur atoms, any nitrogen atom having two aromatic rings attached thereto being part of a cyclic amino compound, and from about 10 to about 10,000 mols per mol of (A) and (B) of (C) at least one polymerizable organic cyclic oxide monomer including in its structure at least one oxygen-carbon ring containing one oxygen atom and from 2 to 3 carbon atoms and up to 70 carbon atoms, and then, at a temperature sufficient to effect polymerization, polymerizing said cyclic oxide monomer through said oxygen-carbon ring whereby said ring opens to form substantially linear polyether structures. These polymers are useful as plasticizers, in making coated fabrics, packaging films, elastic fibers, and adhesives as well as in making tires, shoe heels, raincoats, upholstery material, floor mats and molded articles.

3,598,766

POLYMERIC HETEROCYCLIC NITROGEN COMPOSITIONS

Carl S. Marvel, Tucson, Ariz., and Domenico Fabbro, St. Paul, Minn., assignors to Research Corporation, New York, N.Y.

No Drawing. Filed Nov. 5, 1968, Ser. No. 773,676

Int. Cl. C08g *33/02*

U.S. Cl. 260—2 1 Claim

Poly(benzene - 1,2:4,5 - tetrayl - 1,2 - diimino) having desirable high-temperature stability is prepared by the self-condensation of 1,2,4,5 - tetraaminobenzene in polyphosphoric acid.

3,598,767

SILICON-CONTAINING BENZIMIDAZOLE POLYMER AND METHOD OF MAKING SAME

Hanna N. Kovacs, Kew Gardens, Alvin D. Delman, Old Bethpage, and Bernard B. Simms, Franklin Square, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1969, Ser. No. 794,060
Int. Cl. C08f *35/02*
U.S. Cl. 260—2 2 Claims

An aromatic silicon-containing benzimidazole polymer is prepared from bis(p-carbopentachlorophenoxyphenyl) diphenylsilane obtained by oxidizing diphenyldi(p-tolyl) silane to a dicarboxylic acid and esterifying the latter. The new silicon-containing benzimidazole polymer is soluble in organic solvents, stable at temperatures ranging up to several hundred degrees centigrade, has electrical insulating properties, is moldable into a shaped solid, filament, sheet film, or film coating having good adhesion to smooth surfaces.

3,598,768

HETERO-AROMATIC AZOPOLYMERS

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation of application Ser. No. 527,503, Feb. 15, 1966. This application July 9, 1969, Ser. No. 840,455
Int. Cl. C08g *33/00, 33/02*
U.S. Cl. 260—2 6 Claims

Fiber forming azo polymers are prepared from aromatic primary diamines which contain an internal heterocyclic linkage by oxidative solution polymerization.

3,598,769

PROCESS FOR EXPANDING POLYSTYRENE

Daniel Hanton, La Neuville-Roi, Oise, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Filed Apr. 13, 1966, Ser. No. 542,363
Claims priority, application France, Apr. 14, 1965, 13,184
Int. Cl. C08f *47/10;* B29d *27/00*
U.S. Cl. 260—2.5 6 Claims

Process and apparatus for the expansion of granules of polystyrene containing a blowing agent. The granules are first subjected for a few minutes, to steam at low pressure, following by conditioning for a few hours at about 20° to 40° C. After this the expanded granules are reheated with hot air to about 100° C., then again treated with steam for 30 to 40 seconds. This is followed by conditioning for 1 to 24 hours. In each instance, conditioning is effected by insufflating the granules with warm air at the desired temperature. The cycle just described may be repeated one or more times to result in a further reduction in specific mass. The invention provides a means and procedure by which polystyrene of an initial specific mass of about 650 kg./m.^{3} may be expanded to an apparent specific mass of from 3.5 to 5 kg./m.^{3}. The cycle may also be carried out by first treating the mass with hot air and then, following the rest or conditioning period, with steam. The apparatus affords means by which the process can be carried out in a continuous manner.

3,598,770

ACRYLATE LATEX AND LATEX FOAM PRODUCTS

Carl Moore, Midland, Mich., and Donald B. Parrish, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 24, 1967, Ser. No. 640,833
Int. Cl. C08f *47/10;* C08j *1/16*
U.S. Cl. 260—2.5 8 Claims

A film-forming latex comprising a copolymer of (a) an α,β-ethylenically unsaturated carboxylic acid, e.g., methacrylic acid, (b) a mono(hydroxyalkyl) ester of ethylenically unsaturated carboxylic acid, e.g., 2-hydroxyethyl acrylate and (c) at least one alkyl ester of an α,β-monoethylenically unsaturated carboxylic acid, e.g. butyl acrylate, is prepared by emulsion polymerization. A modified, copolymer aqueous dispersion is prepared by blending the latex with an organic coreactive material, e.g. a melamine-formaldehyde resin, and optional formulating ingredients. Latex foam is prepared from the modified, copolymer aqueous dispersion, which may contain optional formulating ingredients, by frothing the resulting foam formulation, and curing and drying the wet froth thus obtained to form latex foam sponge. Other articles are obtained, for example, by applying the wet froth to a textile substrate, then carrying out the curing and drying steps.

3,598,771

POLYURETHANE COMPOSITIONS PREPARED FROM POLYISOCYANATES AND PHENOL-ALDEHYDE RESINS

Billy D. Davis, Elvis E. Jones, and Roy E. Morgan, Jr., Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 4, 1968, Ser. No. 781,260
Int. Cl. C08g *22/08, 22/26, 22/44*
U.S. Cl. 260—2.5 6 Claims

The invention concerns polyurethane resins and foams derived from phenol-aldehyde resins and polyisocyanates. It relates more particularly to non-burning polyurethane foams of novolac resins and polyisocyanates.

3,598,772

MINERAL FILLED POLYURETHANE FOAMS

Bruce G. Hood, Marblehead, and Robert A. Gardella, Swampscott, Mass., assignor to Hood Foam Industries, Inc., Marblehead, Mass.

No Drawing. Continuation-in-part of application Ser. No. 702,513, Feb. 2, 1968, which is a continuation-in-part of application Ser. No. 550,893, May 18, 1966, which in turn is a continuation-in-part of application Ser. No. 335,356, Jan. 2, 1964. This application Jan. 28, 1969, Ser. No. 794,787
Int. Cl. C08g *22/44, 51/04*
U.S. Cl. 260—2.5 5 Claims

Polyurethane foams derived from polyesters or polyethers have uniformly dispersed therein from 75 to 200% of an inert mineral filler on the weight of the polyurethane, including zirconium silicate and silica. The fillers have densities between 2 and 5.5 grams per cubic centimeter and particles which vary in average size from 120 to 400 microns in diameter and are substantially spherical in shape, and are admixed with the polyurethane-forming material prior to the foaming reaction. The polyurethane-forming material includes a long chain polyol, an organic polyisocyanate, and water in an amount between 3 and 4.5 percent by weight of the polyol used.

3,598,773

THERMOSETTING PROTEIN RESIN COMPOSITION COMPRISING AN AQUEOUS SOLUTION OF AN ANIMAL PROTEIN, UREA OR OTHER CARBAMIDE, AND AN ALDEHYDE

Thomas F. Mitchell, Arlington Heights, and Algird S. Pakeltis, Lemont, Ill., assignors to Darling & Company, Chicago, Ill.

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,960
Int. Cl. C08g *37/32;* C09h *11/00;* C09j *3/00*
U.S. Cl. 260—6 8 Claims

An improved protein-amine-aldehyde resin composition and particularly an animal glue-urea-formaldehyde resin composition which is thermosetting and forms a strong adhesive bond having good water, oil, heat and abrasion resistance and which is especially suited for use in the

manufacture of sandpaper and which also has general application as an adhesive or size for paper, cloth, wood, metal and vitreous materials.

3,598,774

ANTIMONY SULFIDE IN ELECTRODEPOSITABLE COMPOSITIONS

Rowland S. Hartzell, Gibsonia, Pa., and Gerald R. Gacesa, Franklin, Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 790,875, Jan. 13, 1969, which is a division of application Ser. No. 598,160, Dec. 1, 1966. This application Nov. 10, 1969, Ser. No. 875,482

Int. Cl. C08g *51/04*

U.S. Cl. 260—18R 4 Claims

This invention relates to novel, pigmented electrodepositable compositions. More particularly, this invention relates to the use of antimony sulfide in pigmentary form to produce black or dark-colored electrodepositable compositions.

3,598,775

EMULSION SYSTEMS ADAPTED TO DEPOSIT COATINGS BY ELECTROPAINTING

Olin W. Huggard, Rocky River, Ohio, assignor to Mobil Oil Corporation

No Drawing. Filed Nov. 30, 1967, Ser. No. 686,844

The portion of the term of the patent subsequent to Sept. 5, 1984, has been disclaimed

Int. Cl. C08g *45/06*

U.S. Cl. 260—18 17 Claims

Aqueous emulsions particularly adapted for electropainting are provided with the discontinuous oil phase of the emulsion comprising epoxy resin esters in water immiscible organic solvent solution, the oil phase of the emulsion being stabilized utilizing an acidic epoxy resin ester having an acid number of at least 40 as a water dispersible film-forming emulsifying agent. Heat-hardening formaldehyde condensates such as aminoplast resins may be included in the discontinuous oil phase of the emulsion.

3,598,776

BLENDS OF DISPROPORTIONATED ROSIN, A STABILIZER, AND A THERMOPLASTIC POLYMERIC MATERIAL

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed June 28, 1965, Ser. No. 467,325

Int. Cl. C08f *45/58*

U.S. Cl. 260—27 4 Claims

Addition of a disproportionated rosin to polypropylene makes it possible to include additional amounts of dilauryl thiodipropionate stabilizer in the polymer without stabilizer bloom.

3,598,777

SOLUTIONS OF POLYETHYLENIMINE AND THE REACTION PRODUCT OF Ti, Zr, AND Hf CHLORIDES WITH TRIMETHYL BORATE, AND SUBSTRATES COATED THEREWITH

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

No Drawing. Filed May 9, 1969, Ser. No. 823,483

Int. Cl. B32b *17/10;* C08g *23/12, 49/00*

U.S. Cl. 260—29.2 19 Claims

This invention provides solutions in water or an alcohol containing not more than four carbon atoms of the reaction product of trimethyl borate with the chloride of a metal selected from Ti(IV), Zr(IV) and Hf(IV) and (1) a polymer of ethylene imine having a molecular weight between about 600 and 100,000 or (2) the reaction product of ethylene oxide with a polyethylenimine having a molecular weight between about 40,000 and 60,000. These solutions are useful for coating anionic material, such as glass, clay, silica, cellulose and leather to form a water insoluble coating when dried. Rubber reinforcing clays treated with these solutions show marked improvement in their rubber reinforcing qualities.

3,598,778

AMMONIUM HYDROXIDE POLYMER SOLUTIONS FOR FLOOR POLISH COMPOSITIONS

Donald L. Burdick, Overland Park, Kans., and William J. Heilman, Allison Park, and Gerald J. Mantell, Allentown, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Original application Jan. 19, 1967, Ser. No. 610,253, now Patent No. 3,488,311. Divided and this application Mar. 19, 1969, Ser. No. 816,476

Int. Cl. C08f *27/12, 43/08;* C09g *1/10*

U.S. Cl. 260—29.6H 4 Claims

Aqueous solutions of ammonium salts of a small group of half esters formed from maleic anhydride-olefin copolymers are useful in improved floor polish formulations. The class of copolymers include partially esterified copolymers of maleic anhydride with 1-hexene, 1-butene dimers, 1-octene and 1-decene in olefin/maleic anhydride molar ratios of 1 to 1.5, having acid numbers of at least 150, no anhydride groups or adjacent carboxy groups and inherent viscosities in acetone at 25° C. of from about 0.04 to 1.1 deciliters per gram at 5 g./dl. concentration.

3,598,779

POLYVINYL COMPOUNDS WITH GRAFTS OF SULFOPROPYL AND ACRYLONITRILE RESIDUES USED TO IMPROVE DYEABILITY OF ACRYLIC POLYMERS

Jean-Claude Galin, Strasbourg, France, assignor to Societe Rhodiaceta, Paris, France

No Drawing. Filed Sept. 15, 1969, Ser. No. 858,162

Claims priority, application France, Sept. 17, 1968, 166,517

Int. Cl. C08f *3/34, 45/46*

U.S. Cl. 260—30.8 7 Claims

Polyvinyl compounds having sulfopropyl and acrylonitrile residues grafted thereon, which are novel, may be blended with acrylonitrile polymers to improve dyeability of the latter with basic dyestuffs.

3,598,780

POLYETHERURETHANE SOLUTIONS AND USES THEREFOR

George Shkapenko, Akron, and Gerald E. van Gils, Tallmadge, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

No Drawing. Original application Jan. 16, 1968, Ser. No. 698,149, now Patent No. 3,535,143, dated Oct. 20, 1970. Divided and this application May 4, 1970, Ser. No. 34,572

Int. Cl. C08g *51/34*

U.S. Cl. 260—33.4 5 Claims

This invention comprises a $CaCl_2$-alcohol solvent containing certain polyetherurethanes as a solute, such a solution being useful for the treatment of sponges and foams to render them hydrophilic and for the preparation of microporous films.

3,598,781

ADHESIVE VINYL CHLORIDE PLASTISOLS CONTAINING CALCIUM OR MAGNESIUM OXIDE

Lawrence Edward Shadbolt, London, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 684,487, Nov. 20, 1967. This application Aug. 2, 1969, Ser. No. 852,479

Claims priority, application Great Britain, Nov. 28, 1966, 53,129/66

Int. Cl. C08f *45/38*

U.S. Cl. 260—31.8R 2 Claims

The present invention relates to a heat curable adhesive plastisol containing polyvinyl chloride or a vinyl chloride

co-polymer, a plasticiser, an unsaturated monomeric ester, a curing catalyst and 10–50% w./w. alkaline earth metal oxide which can serve to form an adhesive bond between two substrates. The strength of this bond is developed by a heat curing process and is retained after immersion in lubricating oil at 130–140° C. for a period of about 500 hours.

3,598,782

STABILIZATION OF BUTADIENE-STYRENE CO-POLYMERS WITH SUBSTITUTED XYLYLENE DI-AMINES

Joseph A. Beckman and Edward L. Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed June 16, 1969, Ser. No. 833,681
Int. Cl. C08f *45/60*
U.S. Cl. 260—45.9 4 Claims

N,N'-bis-substituted, N,N,N'-tris-substituted and N,N,N',N'-tetra-substituted xylylenediamines and unvulcanized, rubbery interconnected stereo-linear polymers stabilized therewith.

3,598,783

POLYSILOXANE AMIDES

Fred F. Holub, Schenectady, and Denis R. Pauzé, Scotia, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,688
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5E 9 Claims

Polysiloxane amides are obtained from the reaction of an organic diamine, a phthaloyl halide selected from the class consisting of terephthaloyl and isophthaloyl halides, and a polysiloxane containing terminal silicon-bonded

groups where R is a divalent hydrocarbon radical and Z is a halogen, or hydroxyl radical or the —OCH_3 radical. Heat-resistant compositions obtained from such polysiloxane amides can be used for insulation and protective purposes where resistance to heat and corona are important requirements.

3,598,784

POLYSILOXANE AMIDES

Fred F. Holub, Schenectady, and Denis R. Pauzé, Scotia, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,724
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 11 Claims

Polysiloxane amides and polysiloxane amide imides are obtained from the reaction of an organic diamine, a tetracarboxylic dianhydride and a polysiloxane containing terminal silicon-bonded

groups where R is a divalent hydrocarbon radical and Z is a halogen, or the hydroxyl radical or the —OCH_3 radical. The polysiloxane amide is converted to the polysiloxane amide imide by heating at elevated temperatures.

3,598,785

POLYSILOXANE AMIDES

Fred F. Holub, Schenectady, and Denis R. Pauzé, Scotia, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,756
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 12 Claims

Polysiloxane amides are obtained from the reaction of an organic diamine, either trimellitic anhydride or a halo-formyl phthalic anhydride, and a polysiloxane containing terminal silicon-bonded

groups where R is a divalent hydrocarbon radical and Z is a halogen, or hydroxyl radical, or the —OCH_3 radical. Heat-resistant amide imide compositions obtained from converting such polysiloxane amides can be used for insulation and protective purposes where resistance to heat and corona are important requirements.

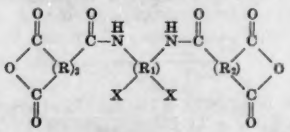
3,598,786

NOVEL OLIGOMERS, NOVEL THERMALLY STABLE POLYMERS AND METHOD OF THEIR MANUFACTURE

Naoya Yoda, Masaru Kurihara, Shunroku Tohyama, Kojuro Ikeda, Noriaki Dokoshi, and Ryoji Nakanishi, Kamakura-shi, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Mar. 31, 1967, Ser. No. 627,290
Claims priority, application Japan, Apr. 5, 1966, 41/20,932; Apr. 9, 1966, 41/22,061; Apr. 23, 1966, 41/25,506; July 16, 1966, 41/46,180; Aug. 9, 1966, 41/51,873; Nov. 30, 1966, 41/48,247, 41/48,248
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 53 Claims

This invention concerns novel oligomers and thermally stable polymers of the novel structure produced from said oligomers and polyamines, and a method of the manufacture of these polymers and oligomers. The said thermally stable polymers have remarkably improved stability against hydrolysis and abrasive resistance over the conventionally known polyimide-type thermally stable polymers, and concurrently possess the excellent properties of the said known polymers. The oligomer may be expressed by the following Formula III:



3,598,787

MOULDING COMPOSITIONS CONTAINING THERMOPLASTIC POLYESTERS

Walter Herwig, Frankfurt am Main, and Klaus Weissermel, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 6, 1969, Ser. No. 804,992
Claims priority, application Germany, Mar. 26, 1968, P 17 69 049.2
Int. Cl. C08g *39/04*
U.S. Cl. 260—75 14 Claims

Thermoplastic moulding compositions on the basis of linear saturated polyesters containing alkali metal salts of cyclic boric acid esters. The compositions have usually good crystallization properties.

3,598,788

PROCESS FOR THE MANUFACTURE OF COPOLYMERS OF TRIOXANE

Karlheinz Burg, Hofheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Jan. 28, 1969, Ser. No. 794,774
Claims priority, application Germany, Feb. 1, 1968, P 17 20 780.6
Int. Cl. C08g *1/20*
U.S. Cl. 260—67 6 Claims

Copolymers of trioxane are prepared by copolymerization of trioxane with cyclic acetals, linear formals,

polyethylene oxides or prepolymers of polyhydric alcohols and formaldehyde in the presence of aqueous perchloric acid as cationic initiator. The products so obtained can be processed in the thermoplastic range and are used for the production of semi-manufactured and finished articles.

3,598,789
FIBER-FORMING PACM–16

Emerson A. Tippetts, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Jan. 8, 1968, Ser. No. 696,105
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 **2 Claims**

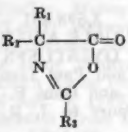
Linear polyamides of fiber-forming molecular weight that are useful for production of high recovery, wash-wear fabrics can be obtained from bi(4-aminocyclohexyl), bis (4-aminocyclohexyl)methane or 1,2 - bis(4-aminocyclohexyl)ethane and hexadecanedioic acid.

3,598,790
AZLACTONE COPOLYMERS

Fritz Kollinsky, Darmstadt-Eberstadt, and Klaus Hubner and Gerhard Markert, Ober Ramstadt-Eiche, Germany, assignors to Rohm & Haas G.m.b.H., Darmstadt, Germany

No Drawing. Continuation-in-part of applications Ser. No. 650,260, June 30, 1967, now Patent No. 3,488,327, and Ser. No. 779,651, Nov. 27, 1968, the latter being a continuation-in-part of application Ser. No. 650,238, June 30, 1967. This application Jan. 5, 1970, Ser. No. 791
Claims priority, application Germany, July 1, 1966, R 43,605; Dec. 1, 1967, P 17 45 348.4
The portion of the term of the patent subsequent to Jan. 6, 1970, has been disclaimed
Int. Cl. C08f *19/00;* **C08g** *17/02*
U.S. Cl. 260—78.3 **16 Claims**

Copolymers of (A) an azlactone



having a copolymerisable ethylenically unsaturated group R_3, (B) a copolymerisable vinylidene compound having at least one free alcoholic hydroxy group therein, and (C) one or more olefinically unsaturated monomers distinct from and copolymerizable with (A) and (B), as well as coatings prepared by cross-linking such copolymers at room temperatures or up to 80° C.

3,598,791
PROCESS FOR THE PREPARATION OF REACTION PRODUCTS FROM α,α-DIHYDROCARBYL-β-PROPIOLACTONE AND ORGANIC HYDROXYL COMPOUNDS

Willem H. M. Nieuwenhuis and Johannes W. J. Koop, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed July 25, 1969, Ser. No. 845,093
Claims priority, application Great Britain, Aug. 5, 1968, 37,168/68
Int. Cl. C08g *17/017, 17/02;* **C09d** *5/02*
U.S. Cl. 260—78.3 **5 Claims**

Compounds characterized by the presence of a quaternary carbon atom adjacent to a carboxyl group are prepared by the reaction between an α,α-dihydrocarbyl-β-propiolactone and organic hydroxyl compounds. The compounds are resins or resin intermediates useful in lacquers or paints that can be applied by electrodeposition from aqueous solutions or dispersions. The compounds exhibit improved stability to hydrolysis.

3,598,792
POLYMERS FROM DIESTERS OF N-ACRYLYLIMINODIACETIC ACIDS

Donald E. Jefferson, Sykesville, and Nelson S. Marans, Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,264
Int. Cl. C08f *1/16, 3/50, 15/16*
U.S. Cl. 260—78.4 **20 Claims**

Polymers and copolymers of diesters of N-acrylyliminodiacetic acids are prepared by irradiating such diesters or mixtures thereof with methyl acrylate, methyl methacrylate, a vinylpyridine, N-vinylpyrrolidone, styrene, acrylonitrile, or vinyl acetate.

These polymers and copolymers are also prepared by treating such diesters or mixtures thereof with methyl acrylate, methyl methacrylate, a vinylpyridine, N-vinylpyrrolidone, styrene, acrylonitrile, or vinyl acetate with a free radical initiator.

These polymers can be hydrolyzed (or saponified and acidified) to convert them from the ester form to the carboxylic form.

3,598,793
ALKALI METAL SALTS OF CARBOXYLATED DIENE POLYMERS AND VULCANIZATES THEREOF

Russell W. Koch, Blacksburg, Va., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Dec. 10, 1968, Ser. No. 782,754
Int. Cl. C08f *27/06*
U.S. Cl. 260—79.5B **8 Claims**

Rubbery homopolymers of conjugated dienes of 4 and 5 carbon atoms and copolymers thereof with styrene and other vinyl aromatic monomers, which have been metalated along the backbone of the molecular chain by an alkali metal, are converted to carboxylates. Monovalent metal salts (e.g. sodium or lithium salts) of the carboxylates are compounded for curing in a zinc oxide-containing formulation. The compounded stocks have high green strength and other valuable properties.

3,598,794
RECOVERY OF FLUOROELASTOMER FROM AQUEOUS DISPERSION

Arthur Nersasian, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 25, 1969, Ser. No. 802,237
Int. Cl. C08f *1/92*
U.S. Cl. 260—80.76 **6 Claims**

A fluoroelastomer is recovered from an aqueous dispersion of the elastomer by admixing the dispersion with a small amount of a polyamine and separating the elastomer from the mixture.

3,598,795
PROCESS OF PREPARING POLYMERS OF OLEFINICALLY UNSATURATED COMPOUNDS USING METAL CARBONYLS WITH METAL HALIDES

Cornelis E. P. V. van den Berg, Geleen, and Adrianus C. Moerkamp, Born, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed Jan. 3, 1968, Ser. No. 695,327
Claims priority, application Netherlands, Jan. 5, 1967, 6700205
Int. Cl. C08f *1/28, 19/06*
U.S. Cl. 260—84.1 **14 Claims**

A process is described for the polymerization of monovinylaromatic monomers, with or without conjugated diene co-monomers, using a mixture of a transition metal

carbonyl compound and a metal halide such as titanium chlorides as the catalyst. Certain novel random copolymers are also described, resulting from this process.

3,598,796
CYCLOPENTENE POLYMER PRODUCTION
Karl Nützel, Opladen, Friedrich Haas, Cologne-Buchheim, Karl Dinges, Odenthal, and Wilhelm Graulich, Bergisch-Neukirchen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,677
Claims priority, application Germany, Feb. 24, 1968, P 17 20 791.9
Int. Cl. C08f *5/00, 15/04*
U.S. Cl. 260—88.2 **4 Claims**

Production of polymers of cyclopentene in solvent solution by the addition of catalyst components comprising tungsten hexachloride, cyclopentene-hydroperoxide and aluminum alkyl or aluminum alkyl halide, said aluminum alkyl or aluminum alkyl halide being added after the additions of tungsten hexachloride and cyclopentene-2-hydroperoxide and following a change in solvent solution color.

3,598,797
PROCESS FOR MANUFACTURING POLYVINYLIDENE FLUORIDE
Yutaka Kometani, Nishinomiya-shi, Masahiro Okuda, Amagasaki-shi, Chuzo Okuno, Osaka-shi, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka-shi, Japan
No Drawing. Filed June 20, 1968, Ser. No. 738,391
Claims priority, application Japan, June 27, 1967, 42/41,124
Int. Cl. C08f *3/22*
U.S. Cl. 260—92.1 **3 Claims**

A process for manufacturing polyvinylidene fluoride by polymerization of vinylidene fluoride in the presence of tertiary butyl peroxyisobutyrate as a catalyst. The polymerization reaction of the present invention proceeds with a higher polymerization velocity under a lower polymerization pressure than those polymerizations hitherto known. It is also characterized in the fact that the polyvinylidene fluoride obtained by the present process is superior in its properties to that hitherto produced.

3,598,798
PRODUCTION OF VINYL CHLORIDE POLYMERS
Hans-Georg Trieschmann, Birkenweg, Hambach, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed July 31, 1968, Ser. No. 748,913
Claims priority, application Germany, Aug. 9, 1967, P 17 20 288.9
Int. Cl. C08f *3/30*
U.S. Cl. 260—928 **9 Claims**

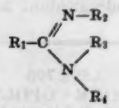
The polymerization of vinyl chloride, with or without other monomers, in two zones, only small amounts of vinyl chloride being polymerized in the first zone, the vinyl chloride being separated from the polymer, and the purified vinyl chloride being polymerized in the second zone.

3,598,799
LACTONE COPOLYMERS
Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Dec. 10, 1969, Ser. No. 883,986
Int. Cl. C08f *19/08*
U.S. Cl. 260—879 **14 Claims**

Copolymers containing lactones are prepared by a polymerization process that embodies the addition of an isocyanate adjuvant that increases the conversion of lactone monomer and provides a lactone copolymer possessing excellent green tensile strength.

3,598,800
ISOBUTANE ISOPENTANE AND PHENYLETHANE AMIDINES
Karl Gätzi, Basel, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed May 22, 1968, Ser. No. 731,255
Claims priority, application Switzerland, May 30, 1967, 7,615/67
Int. Cl. C07c *123/00*
U.S. Cl. 260—293 **8 Claims**

Antifungal compositions are disclosed which contain as active ingredients amidines of the formula



wherein

R_1, R_2, R_3 and R_4 represent certain organic substituents, or salts of such amidines with inorganic or organic acids; these compositions are particularly useful for the protection of plants against phytopathogenic fungi; and also for combatting acarinae such as ticks. Methods for controlling such fungi on the one hand, and acarinae, on the other hand, with the aid of the aforesaid amidine derivatives are also described. Furthermore certain isobutane, isopentane and phenylethane amidines falling under the above formula are disclosed as novel compounds.

3,598,801
WATER-SOLUBLE AZO-PYRIMIDINE DYESTUFFS
Fabio Beffa, Basel, and Paul Lienhard, Herbert Seiler, Hans Ackermann, and Hans E. Wegmüller, Rienhen, Switzerland, assignors to J. R. Geigy A.G., Basel, Switzerland
No Drawing. Filed Jan. 8, 1968, Ser. No. 696,115
Claims priority, application Switzerland, Jan. 9, 1967, 316/67
Int. Cl. C09b *29/36, 62/24;* **D06p** *1/06*
U.S. Cl. 260—154 **5 Claims**

Water-soluble azo-pyrimidine dyestuffs obtained by coupling diazo or tetrazo compounds derived from aromatic monoamines or diamines in an equivalent ratio of about 1:1 with an optionally substituted 2,4,6-triamino-pyrimidine compound which can be coupled in the 5-position, or in an equivalent ratio of 1:2 with identical or different 2,4,6-triamino-pyrimidine compounds of this type, or with one equivalent of such a triamino-pyrimidine compound and one equivalent of another coupling component and, in the case of coupling components containing diazotizable amino groups, the disazo dyestuffs resulting from coupling such diazotized aminoazo-pyrimidine dyestuffs with another coupling component, or dyestuffs obtained by coupling two equivalents of the aforesaid diazotized monoamines with a coupling component comprising two pyrimidyl nuclei linked together via a hydrazino bridge or via certain organic bridge members, the components being so chosen that the final dyestuff contains at least one salt-forming, water solubilizing group which dissociates acid in water and at least three rings per molecule, which are not fused with one another, and of which preferably at least two are carbocyclic or heterocyclic and of aromatic character and the third can be aromatic, or a partly unsaturated or a saturated alicyclic ring. Said dyestuffs produce polyamide dyeings having good fastness to

light and abrasion and excellent wet-fastness properties and when they contain fiber-reactive substituents, the azopyrimidine dyestuffs can also be used for the dyeing of cellulose fibers on which they afford dyeings having good wet-fastness properties, especially fastness to washing.

3,598,802

AZO COMPOUNDS FROM 1-NAPHTHYLAMINES

Max A. Weaver, Clarence A. Coates, Jr., and Herman S. Pridgen, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 19, 1968, Ser. No. 785,364
Int. Cl. C07c *107/08;* C09b *29/06*
U.S. Cl. 260—196 3 Claims

Azo compounds having a 2-halo-4,6-dinitrophenyl or 2-cyano-4,6-dinitrophenyl diazo component and a 1-naphthylamine coupling component are useful as dyes for hydrophobic, particularly polyester, textile materials.

3,598,803

1-PHENYLAZO-2,3-HYDROXYNAPHTHOLIC ACID PHENYL AMIDE CONTAINING A SULFONIC ACID IMIDO-UREIDE GROUP

Armand Henrard, Gand, Belgium, and Fritz Kehrer and Hans Wasem, Basel, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Filed Dec. 19, 1967, Ser. No. 691,707
Claims priority, application Switzerland, Jan. 17, 1967, 630/67; Jan. 26, 1967, 1,173/67
Int. Cl. C07c *107/08;* C09b *29/20*
U.S. Cl. 260—204 8 Claims

Pigments of the monoazo series which contain a nuclearly bound sulfonic acid imido-ureide group are useful for the coloration of plastics, textiles, paper, natural resins and rubber.

3,598,804

PREPARATION OF KETALS

Nathan Chadwick Hindley, Welwyn Garden City, and Michael James O'Leary, Welwyn, England; Niklaus Halder, Oberwil, Switzerland, and Gerald Myer Jaffe, Verona, and Peter Hans Weinert, Wayne, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,714
Claims priority, application Great Britain, Feb. 4, 1969, 5,862/69
Int. Cl. C07c *47/18*
U.S. Cl. 260—209R 26 Claims

Preparation of ketal sugars from sugars by reacting the sugar with a ketone or aldehyde utilizing ferric chloride or ferric bromide as a catalyst and a water immiscible inert organic solvent having a boiling point of less than 55° C.

3,598,805

ERYTHROMYCIN ESTER DERIVATIVES

Peter Hadley Jones, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 807,444, Mar. 14, 1969, which is a continuation-in-part of application Ser. No. 654,046, July 18, 1967. This application Feb. 26, 1970, Ser. No. 14,681
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 6 Claims

The 4′-hydroxyerythromycin A and B derivatives together with its acid-addition salts have been found to have antibiotic activity. The compound has been made by oxidation of erythromycin A or B to the N oxide, followed by pyrolysis to 3-(dedimethylamino)-$\Delta^{3',4'}$-erythromycin. The unsaturate is then epoxidized and 3′-(dedimethylamino) - 3′-azido-4′-hydroxyerythromycin formed by opening the epoxy ring with an azide. The azide is then reduced to 3′-(dedimethylamino)-3′-amino-4′-hydroxyerythromycin, which is further reduced in the presence of formaldehyde to 4′-hydroxyerythromycin.

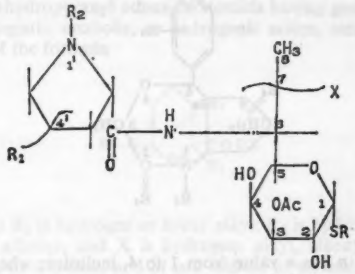
3,598,806

PROCESS FOR PREPARING LINCOMYCIN-3-MONOACYLATES

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,416
Int. Cl. C07c *47/18*
U.S. Cl. 260—210R 13 Claims

This invention relates to a novel process for the manufacture of lincomycin-3-monoacylate compounds, including novel 7-halogenated lincomycin-3-monoacylate compounds, selected from the group consisting of the free bases and acid addition salts of the formula:



wherein R is alkyl of 1 to 6 carbon atoms, inclusive; R_1 is alkyl of 2 to 8 carbon atoms, inclusive; R_2 is alkyl of 1 to 8 carbon atoms, inclusive, or hydrogen; X is hydroxy, chlorine, bromine or iodine; and Ac is the acyl radical of a hydrocarbon carboxylic acid containing 1 to 18 carbon atoms, inclusive. In the above Formula I, the vertical wavy line ∫ is used to indicate that the group R_1 can be in the cis position (below the plane of the ring) or in the trans position (above the plane of the ring), with respect to the carbonyl group. The horizontal wavy line ~ is used to indicate that both epimers are to be included in the group, the 7(R) (or D-erythro) configuration and the 7(S) (or L-threo) configuration. These lincomycin-3-monoacylate compounds can be used as antibacterial agents, for example to inhibit the growth of *Staphylococcus aureus* and *Sarcina lutea* on dental and medical equipment contaminated with these organisms. The novel 7-halogenated 3-monoacylate esters are particularly advantageous in having greater antibacterial activity than the 7-hydroxy esters.

The novel process for selective 3-monoacylation of lincomycin compounds of this invention comprises mixing a solution of the lincomycin compound or its acid addition salt with the acid anhydride or acyl halide of a hydrocarbon carboxylic acid and a sterically hindered strongly basic tertiary amine and reacting under mild conditions.

3,598,807

PYRAZOLE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Kiyoshi Nakayama, Sagamihara-shi, and Haruo Tanaka, Machida-shi, Japan, assignors to Kyowa Hakko Kogyo, Ltd., Tokyo, Japan

Filed Aug. 5, 1969, Ser. No. 847,697
Claims priority, application Japan, Aug. 5, 1968, 43/54,945
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5R 8 Claims

3(5)-amino-4-pyrazole-carboxamide, the 1 - β-D-ribofuranoside thereof and the 1-β-D-ribofuranoside-5′-phosphoric acid ester thereof are prepared by heating the corresponding 4-oxy-1H-pyrazolo(3,4-d)-pyrimidine and its derivatives at a temperature of up to 180° C., preferably 100°–140° C., in an aqueous solution having an alkaline pH, preferably 9.0–13.0. The products display anti-bacterial activity and are useful for the study of nucleic acid metabolism.

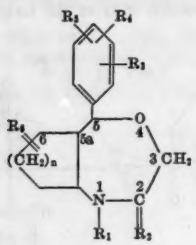
3,598,808

PERHYDRO - 5 - PHENYL-CYCLOALKAPOLYENE-1,4-OXAZEPINES AND THEIR PREPARATIONS

Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

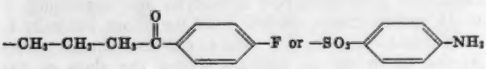
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,135
Int. Cl. C07d 87/54
U.S. Cl. 260—239.3 74 Claims

Perhydro - 5 - phenyl - cycloalkapolylene - 4,1-oxazepines of the Formula XXIII:



XXIII

wherein n has a value from 1 to 4, inclusive; wherein R_1 is hydrogen, alkyl from 1 to 16 carbon atoms, inclusive, phenylalkyl, heterocyclicaminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkanoyl from 1 to 16 carbon atoms, inclusive, benzoyl, phenylacetyl,



wherein R_2 is

wherein R_3, R_4 and R_5 are selected from the group consisting of hydrogen, hydroxy, halogen, lower alkyl, lower alkoxy, lower alkanoyloxy and CF_3; and wherein R_6 is hydrogen or

including acid addition salts, quaternary ammonium salts, the N-oxides and acid addition salts thereof are prepared. The compounds of the formula above, wherein R_2 is

stimulate the central nervous system and can be used orally or parenterally in the treatment of respiratory difficulties and geriatrics in farm or pet animals. The compounds of the above formula wherein R_2 is =O are intermediates.

3,598,809

FUSED BI- AND TRICYCLIC, DI-, TRIDIAZA-, AND THIODIAZA COMPOUNDS

Marcel K. Eberle, Madison, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,376
Int. Cl. C07d 53/00, 53/02, 93/40
U.S. Cl. 260—239.3 10 Claims

Fused bi- and tricyclic, di-, tri- and thiodiaza compounds, e.g. 2,3,3a,10-tetrahydro - 3 - phenylbenzo[b]pyrrolo[2,3-e][1,4]diazepin-4(3H)-one prepared by treating a corresponding substituted pyridine or pyrroline with a substituted aniline o-phenylenediamine, ethylenediamine or diaminopropane. The compounds are useful at tranquilizers and hypotensives.

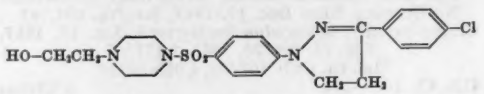
3,598,810

FLUORESCENT 1-(PYRAZOLINYLPHENYL-SULPHONYL)-PIPERAZINES

Eduard Troxler, Basel, and Heinrich Hausermann, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 8, 1968, Ser. No. 765,964
Claims priority, application Switzerland, Oct. 13, 1967, 14,364/67
Int. Cl. B44d 5/00; C07d 51/72
U.S. Cl. 260—239.7 4 Claims

Fluorescent 4-substituted 1-(pyrazolinylphenylsulphonyl)-piperazines which are soluble in aqueous acid media, are disclosed as optical brighteners especially for wool, fibers from synthetic polyamide, cellulose esters, polymers or copolymers of acrylonitrile, blends of such fibers as well as similar substrates. A typical novel compound is that of the formula



3,598,811

DERIVATIVES OF 4α,8,14-TRIMETHYL-18-NOR-5α,8α,9β,13α,14β,17α-PREGNANE

Hans U. Immer, St. Laurent, Quebec, Canada, assignor to Ayerst, McKenna & Harrison, Limited, St. Laurent, Quebec, Canada

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,734
Int. Cl. C07c 173/00
U.S. Cl. 260—239.55 13 Claims

There are disclosed herein 3α,3β-(ethylenedioxy)-4α,8,14 - trimethyl - 18 - nor-5α,8α,9β,13α,14β,17α-pregnan-20-one, 4α,8,14 - trimethyl - 18 - nor - 5α,8α,9β,13α,14β,17α-pregnane-3,20-dione, and 3β-hydroxy-4α,8,14-trimethyl-18-nor-5α,8α,9β,13α,14β,17α-pregnan-20-one as well as its 3-tetrahydropyranyl ether and its 3-acetate, and intermediates used in their syntheses. The compounds have cholesterol-lowering and antibacterial activities, and methods for their preparation and use are also disclosed.

3,598,812

5-NITROFURYL DERIVATIVES

William Hoyle, Bramhall, and Gordon Peter Roberts, Altrincham, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,241
Claims priority, application Great Britain, Sept. 12, 1968, 43,374/68
Int. Cl. C07d 5/30
U.S. Cl. 260—240 3 Claims

5-nitro-2-furfurylideneamino-oxazolidinones are useful antimicrobial agents; compositions containing these compounds and methods for the treatment of microbial infections, particularly of urinary tract infections, and for the protection of organic material susceptible to microbial attack, employing these compounds; an illustrative embodiment is 5-methylsulphonyloxymethyl-3-(5-nitrofurfurylideneamino)-2-oxazolidinone.

3,598,813

ACIDIC POLYMETHINE DYES AND HOLOPOLAR CYANINES

Edward B. Knott, Wealdstone, Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application July 2, 1964, Ser. No. 380,055, now Patent No. 3,395,017. Divided and this application Jan. 19, 1968, Ser. No. 699,035

Int. Cl. C09b *23/00, 23/04*

U.S. Cl. 260—240.1 11 Claims

Certain acidic polymethine dyes and holopolar cyanine dyes derived by reacting (1) quaternized hydroxyarylmethylenerhodanines, hydroxyheterocyclylmethylenerhodanines and β-substituted ethylidenerhodanines with (2) a cyclammonium quaternary salt containing an active methyl group are useful optical sensitizing dyes. The dyes and light-sensitive photographic elements containing them are believed to be novel. 3-ethoxycarbonylmethyl - 5 - [3 - ethoxycarbonylmethyl-5-(4-hydroxy-2-oxochromen - 3 - ylmethylene) - 4 - oxothiazolidin - 2-ylidene] - 2 - thiothiazolid-4-one, anhydro-[3 - ethyl-2-benzothiazole] [3 - ethoxycarbonylmethyl-5-(4-hydroxy-2-oxochromen - 3 - ylmethylene) - 4-oxo-2-thiazoline]-methinecyanine hydroxide and 5-[5-(2,2-dicyanovinyl)-3-ethyl-4-hydroxythiazolin - 2 - ylidene] - 3-ethyl-2-thiothiazolid-4 - one, for example are illustrative dye compounds.

3,598,814

3,3a-DIHYDRO-2H,9H-ISOXAZOLO(3,2-b)(1,3) BENZOXAZIN-9-ONES

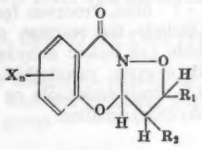
David B. Reisner, Hightstown, Bernard J. Ludwig, North Brunswick, Harold M. Bates, Nutley, and Frank M. Berger, Princeton, N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 826,738, Mar. 24, 1969. This application Jan. 21, 1970, Ser. No. 4,745

Int. Cl. C07d *87/16*

U.S. Cl. 260—244 21 Claims

Chemical compounds of the formula:



wherein *n* is 1 or 2 and wherein each X is hydrogen, hydroxy, halogen, lower alkyl, lower alkoxy, nitro, amino, acetamido, sulfonamido or trifluoromethyl and each R is selected from the group consisting of hydrogen and lower alkyl. Said compounds have valuable anti-inflammatory, antipyretic and diuretic activities in standard laboratory animals.

3,598,815

BIS-(HYDROXYPHENYLALKYLENE) ALKYL ISOCYANURATES

Jack C. Gilles, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Oct. 25, 1968, Ser. No. 770,846

Int. Cl. C07d *55/38*

U.S. Cl. 260—248 8 Claims

Novel mixed esters of isocyanuric acid have been prepared. These bis-(hydroxyphenylalkylene)alkyl isocyanurate compounds provide excellent stabilization for organic materials against oxidative, thermal and photochemical degradation. The stability of α-monoolefin homopolymers and copolymers is particularly enhanced by the use of stabilizing amounts of the bis-(hydroxybenzyl)isocyanurates.

3,598,816

TETRAHYDROPYRANYLETHERS OF STEROIDS AND PROCESS FOR THEIR MANUFACTURE

Werner Haede, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Ulrich Stache, Gerhard Vogel, Hofheim, Taunus, and Kurt Radscheit, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius and Bruning, Frankfurt am Main, Germany

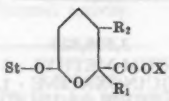
No Drawing. Filed Sept. 13, 1967, Ser. No. 667,368

Claims priority, application Germany, Oct. 13, 1966, F 50,421; Apr. 29, 1967, F 52,300

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 10 Claims

Tetrahydropyranyl ethers of steroids having gestagenic, antiphlogistic, anabolic, or androgenic action, said ethers being of the formula



wherein R_1 is hydrogen or lower alkyl; R_2 is hydrogen, alkyl or alkenyl; and X is hydrogen, alkyl, alkenyl, aryl, aralkyl, or a cation; and St is a radical of an androstane, androstene, pregnane, pregnene, or pregnadiene, or of a halo-derivative thereof, or of a cardenolide or bufadienolide.

3,598,817

AMINOALKYL ESTERS OF 4-BENZYLPIPERIDINE-1-CARBOXYLIC ACID

Claude L. C. Carron and Maurice C. E. Carron, Hauts-de-Seine, and Bernard Ph. Bucher, Essonne, France, assignors to Societe Anonyme des Laboratoires Robert et Carriere, Paris, France

No Drawing. Filed Dec. 2, 1968, Ser. No. 780,553

Claims priority, application France, Dec. 5, 1967, 130,945; Aug. 30, 1968, 164,686; Oct. 8, 1968, 169,105

Int. Cl. C07d *29/24*

U.S. Cl. 260—247.2 34 Claims

The invention provides novel aminoalkyl esters of 4-benzylpiperidine-1-carboxylic acid and their salts which are useful in treating cardiac disturbances.

3,598,818

METHOD FOR THE SEPARATION OF MELAMINE FROM A GASEOUS REACTION MIXTURE OF MELAMINE, AMMONIA AND CARBON DIOXIDE

Jacobus T. C. Krekels, Sittard, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed Nov. 17, 1969, Ser. No. 877,224

Claims priority, application Netherlands, Nov. 16, 1968, 6816385

Int. Cl. C07d *55/24*

U.S. Cl. 260—249.7P 9 Claims

A process is disclosed for the separation and recovery of melamine from gaseous mixtures of melamine, ammonia and carbon dioxide obtained in the manufacture of melamine from urea and under superatmospheric pressure. The process involves feeding a dilute suspension of melamine crystals in a solution saturated with ammonium and carbon dioxide into at least one hydrocyclone and obtaining by separation therein (a) a concentrated aqueous melamine solution and (b) a dilute melamine solution; and recirculating this dilute melamine solution containing most of the ammonia and carbon dioxide components of the aforesaid gaseous mixture, to the initial cooling zone wherein melamine crystals are first obtained in the form of a suspension in an aqueous solution containing ammonia and carbon dioxide.

3,598,819

QUINOXALINE DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Edward O. Stapley, Spotswood, N.J., Justo M. Mata, Madrid, Spain, and Frank J. Wolf, Westfield, and Thomas W. Miller, Carteret, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,008
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 11 Claims

A novel antibiotic substance, identified as 6 - chloro - 2-quinoxalinecarboxylic acid 1,4 - dioxide, has been produced by cultivating strains of *Streptomyces ambofaciens*, var. NRRL 3455. The salts, as well as derivatives such as esters, amides and N-substituted amides, likewise demonstrate antibiotic activity.

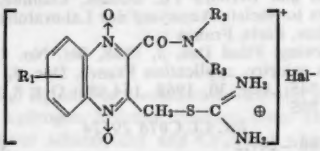
3,598,820

2 - ISOTHIOURONIUM-METHYL - 3 - CARBOXYLIC ACID AMIDO-QUINOXALINE - 1,4 - DI-N-OXIDE HALIDES AND THEIR PRODUCTION

Kurt Ley, Odenthal-Globusch, Ulrich Eholzer, Cologne-Stammheim, Roland Nast, Cologne-Buchheim, Karl-Georg Metzger, Wuppertal-Elberfeld, and Dieter Fritsche, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 2, 1968, Ser. No. 764,592
Claims priority, application Germany, Oct. 4, 1967, F 53,669
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 12 Claims

2-isothiouronium-methyl-3-carboxylic acid-amido-quinoxaline-1,4-di-N-oxide halides of the formula:



(I)

wherein

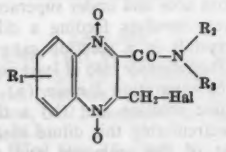
R_1 is hydrogen, lower alkyl, lower alkoxy or chlorine,

R_2 is hydrogen, straight or branched chain alkyl or straight or branched chain alkyl substituted by hydroxy lower alkoxy, acyloxy, monoalkylamino or dialkylamino,

R_3 is hydrogen, straight or branched chain alkyl, straight or branched chain alkyl substituted by hydroxy, lower alkoxy, acyloxy, monoalkylamino or dialkylamino, or when R_2 is hydrogen, cyclohexyl, or R_2 and R_3 together with the amide nitrogen atom form part of a 5- or 6-menbered heterocyclic ring, and

Hal is chlorine or bromine,

are useful for their antibacterial effect. These compounds may be produced, inter alia, by reacting a 2-halomethyl-3-carboxylic acid amido-quioxaline-1,4-di-N-oxide of the formula:



(II)

with thiourea, wherein R_1, R_2, R_3 and Hal are as above defined.

3,598,821

METHOD OF PREPARING N-SUBSTITUTED 1,4,5,6-TETRAHYDRO - 6 - OXO-3-PYRIDAZINE CARBOXYLIC ACIDS

Arnold E. Young and John C. Little, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,387
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 7 Claims

The present disclosure is directed to a process for the preparation of N-substituted 1,4,5,6-tetrahydro-6-oxo-3-pyridazine carboxylic acids. These acids are known in the art and are useful as intermediates in the preparation of N-substituted glutamines.

3,598,822

3-SUBSTITUTED AMINO-6-HYDRAZINO PYRIDAZINES

Paul L. Anderson, Denville, and William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,764
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 5 Claims

Amino pyridazines substituted with a 6-hydrazino group, e.g., 3-diallylamino-6-hydrazino pyridazine, are active as hypotensives and anorexics.

3,598,823

TRICYCLIC QUINAZOLINONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed May 28, 1969, Ser. No. 828,757
Int. Cl. C07d *57/12*
U.S. Cl. 260—256.4 17 Claims

The compounds are biologically active tricyclic quinazolinones of the class of imidazo[2,1-b]quinazolin-5-ones, pyrimido[2,1-b]quinazolin - 6 - ones and diazepino [2,1-b]quinazolin - 7 - ones. Processes for preparation of said compounds include the reaction of a N-carboxy anthranilic anhydride (an isatoic anhydride), or an anthranilic acid with a cyclic pseudothiourea such as 2-organomercapto-4,5-dihydroimidazole or 2 - organomercapto-3,4,5,6-tetrahydropyrimidine.

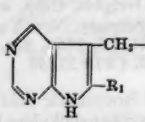
3,598,824

7H-PYRROLO 2,3-d PYRIMIDINE-5-ACETIMIDATES

Franz Troxler, Bottmingen, and Gerhard Bormann, Basel, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed July 15, 1969, Ser. No. 841,959
Claims priority, application Switzerland, July 23, 1968, 11,048/68
Int. Cl. C07d *57/14*
U.S. Cl. 260—256.4 2 Claims

Compounds of the formula:



wherein R_1 is hydrogen or methyl, and the acid addition salts thereof.

The compounds possess strong ganglia-stimulating properties.

3,598,825

2(4 PHENYL PIPERAZINO METHYL) 3 QUINUCLIDINONES

John H. Biel and Harvey B. Hopps, Milwaukee, Wis., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.

No Drawing. Filed Dec. 13, 1967, Ser. No. 690,087

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 6 Claims

2 - [N' - (o - (lower)alkoxyphenyl)piperazinomethyl]-3-quinuclidinone and the pharmaceutically acceptable nontoxic salts thereof are useful as tranquilizers and central nervous system depressants in mammals.

3,598,826

PRODUCTION OF 1,1'-ETHYLENE-1,1',2,2'-TETRAHYDRO-2,2'-BIPYRIDYL

John Francis Cairns and John Anthony Corran, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,002

Claims priority, application Great Britain, Oct. 10, 1967, 45,542/67

Int. Cl. C07d *51/64*

U.S. Cl. 260—268 2 Claims

1,1'-ethylene-1,1',2,2'-tetrahydro - 2,2' - bipyridyls, useful as intermediates for the manufacture of herbicides, as prepared by the reduction of ethylene-bis-pyridinium salts.

3,598,827

PREPARATION OF MONOMERIC OR DIMERIC IMINES AND PYRROLES

John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

No Drawing. Continuation-in-part of application Ser. No. 595,003, Nov. 17, 1966. This application Apr. 7, 1969, Ser. No. 814,170

Int. Cl. C07d *27/26;* C07c *119/00*

U.S. Cl. 260—288 3 Claims

Treatment with manganese dioxide of organo primary amines having at least one hydrogen atom in alpha position to the amino group.

3,598,828

1-OXA-3,8-DIAZA SPIRO(4,5)-2-DECANETHIONE COMPOUNDS

Gilbert Regnier, Sceaux, Roger Canevari, Clamart, Jean-Claude Le Douarec, Suresnes, and Jacques Duhault, Chatou, France, assignors to Societe en nom Collectif "Science Union et Cie, Societe Francaise de Recherche Medicale," Suresnes, France

No Drawing. Filed July 25, 1969, Ser. No. 845,061

Claims priority, application Great Britain, July 29, 1968, 36,100/68

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.4F 9 Claims

There are provided novel 1-oxa-3,8-diaza-8-phenethyl spiro(4,5) - 2 - decanethiones which may, if desired, be substituted on the phenyl nucleus by halogen, trifluoromethyl, lower alkyl or lower alkyloxy having from 1 to 4 carbon atoms in the alkyl moiety, methylenedioxy, sulfamido, dimethylsulfamido, nitro, amino or acylamino groups.

These compounds possess bronchodilator, antitussive, analgesic, anti-inflammatory and gastric antisecretory properties.

3,598,829

CERTAIN ISOXAZOLYLPYRIDINES AND ISOTHIAZOLYLPYRIDINES

Victor John Bauer, Montvale, and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 662,281, Aug. 22, 1967, which is a continuation-in-part of application Ser. No. 535,714, Mar. 21, 1966. This application Nov. 10, 1969, Ser. No. 875,524

Int. Cl. C07d *31/48*

U.S. Cl. 260—294.8D 9 Claims

This application describes the preparation of isoxazolylpyridines and isothiazolylpyridines as new compounds and also their use in preparing the corresponding quaternary isoxazolylpyridinium salts and quaternary isothiazolylpyridinium salts. The quaternary isoxazolylpyridinium salts and quaternary isothiazolylpyridinium salts are useful for their hypoglycemic activity.

3,598,830

5-SUBSTITUTED-1,3,4-THIADIAZOLE-2-CARBOXALDEHYDES

Gerald Berkelhammer, Princeton, and Goro Asato, Titusville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 11, 1968, Ser. No. 767,004

Int. Cl. C07d *91/62*

U.S. Cl. 260—302D 4 Claims

This invention relates to novel 5-amino, 5-acetamido and 5-nitro-1,3,4-thiadiazole-2-carboxaldehydes and their derivatives. These compounds are useful as antibacterial or antifungal agents and are important intermediates for the preparation of 2-amino-5-(1-substituted-2-imidazolyl)-1,3,4-thiadiazoles.

3,598,831

ANTHRAQUINONE PIGMENT DYES

Xaver Pfister, Riehen, near Basel, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 466,112, June 22, 1965. This application Sept. 29, 1967, Ser. No. 671,607

Claims priority, application Switzerland, July 3, 1964, 8,732/64; July 17, 1964, 9,383/64

Int. Cl. C09b *1/42*

U.S. Cl. 260—303 10 Claims

The invention relates to dyes of the anthraquinone series which are highly apt for the pigmentation of semi- or fully synthetic artificial materials, natural and synthetic resins and their solutions, natural or synthetic rubber or paper. The pigmented materials show good color resistance to heat, light and chemicals, and the pigment shows no tendency to migration.

3,598,832

5-ESTERIFIED HYDROXY-THIAZOLIDINE-4-CARBOXYLIC ACID COMPOUNDS

Robert Burns Woodward, 12 Oxford St., Cambridge, Mass. 02138

No Drawing. Original application Aug. 22, 1966, Ser. No. 573,865, now Patent No. 3,481,948. Divided and this application Dec. 16, 1968, Ser. No. 784,193

Claims priority, application Switzerland, Sept. 10, 1965, 12,623/65; Dec. 9, 1965, 16,973/65, 16,974/65; Feb. 3, 1966, 1,530/66

Int. Cl. C07d *91/14*

U.S. Cl. 260—306.7 7 Claims

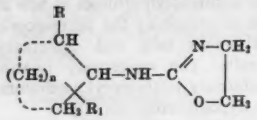
2,2-disubstituted 3-acyl-thiazolidine-4-carboxylic acid compounds containing in 5-position a hydroxy group esterified by a strong acid are intermediates which are useful in the synthesis of 7-amino-cephalosporanic acid compounds.

3,598,833
2-CYCLOALKYLAMINO-OXAZOLINES

Rudolf Hiltmann and Hartmund Wollweber, Wuppertal-Elberfeld, Kurt Stoepel, Wuppertal-Vohwinkel, and Walter Puls, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

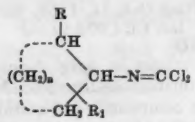
No Drawing. Filed Sept. 22, 1967, Ser. No. 669,691
Claims priority, application Germany, Sept. 27, 1966, F 50,296
Int. Cl. C07d 85/36
U.S. Cl. 260—307 30 Claims

2-cycloalkylamino-oxazolines of the formula:



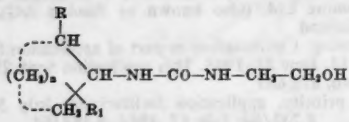
(I)

wherein R is lower alkyl of 1 to 3 carbon atoms, R_1 is hydrogen or at least one lower alkyl of 1 to 5 carbon atoms and *n* is an integer from 2 to 4, and wherein the cycloalkyl moiety may contain a double bond provided that, if there is a double bond, such is not in the α,β-position, are prepared by reacting 2-cycloalkylisocyanide dichlorides of the formula:



(II)

wherein R, R_1 and *n* are as above defined, and in which the cycloalkyl moiety may contain a double bond, with the proviso that if there is a double bond, such is not in the α,β-position, with ethanolamine in organic solents or in water and, if desired, with the addition of a base or they may be prepared by cyclizing reactive esters of N-cycloalkyl-N'-β-hydroxyethyl-ureas of the formula:



(II)

wherein R, R_1 and *n* have the above defined meanings and in which the cycloalkyl moiety may contain a double bond, with the proviso that if there is a double bond, such is not in the α,β-position, by heating in hot water optionally at temperatures above 100° C. under pressure and precipitating the bases by means of ammonia or alkali from the resultant aqueous solution of the 2-cycloalkylamino-oxazoline salts formed. When R_1 is hydrogen, the hydrogen atom is attached to a carbon atom so that in all cases each carbon atom maintains the proper valence. R and R_1 may be all cis, all trans, or some may be cis and the remaining trans. The amino group attached to the carbon atom in the 1-position in the cycloalkyl ring can also be cis or trans. The 2-cycloalkylamino-oxazolines are useful as local anesthetics, sedatives, vaso-constrictors, blood pressure depressants and they also exhibit an inhibitory effect on the secretion of gastric fluid thereby making them valuable for treating hypertonia and ulcers. By virtue of their blood sugar increasing effect, these compounds can also be used in humans and animals in the treatment of diseases whereby increase in blood sugar is desirable. These compounds are administered in the same dosage range and by the same routes of administration as compounds already known to have the above specified effects and properties.

The asymmetrical 2-cycloalkylamino-oxazolines of the present invention exist in racemic form and as is known such racemates can be resolved into their optical isomers.

3,598,834
PROCESS FOR PRODUCING 3-AMINOISOXAZOLE

Katsura Morita, Ikeda, Osaka, Naoto Hashimoto, Suita, Osaka, and Koichi Matsumura, Ikuno-ku, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,741
Claims priority, application Japan, Dec. 13, 1967, 42/79,893
Int. Cl. C07d 85/22
U.S. Cl. 260—307 6 Claims

3-aminoisoxazole is produced by subjecting a novel alkylideneaminoxyacrylonitrile of the formula

$$R{=}N{-}O{-}CH{=}CH{-}CN$$

wherein R=an alkylidene group having 2 to 8 carbon atoms to hydrolysis and ring-closure at a temperature of —10° to 100° C. under acidic conditions in high yields and without being accompanied by any appreciable quantities of by-product.

3,598,835
CERTAIN BENZOCYCLOHEPTOXAZOLONE COMPOUNDS

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc. Hanover, N.J.

No Drawing. Application Dec. 18, 1967, Ser. No. 691,171, now Patent No. 3,408,360, dated Oct. 29, 1968, which is a continuation-in-part of applications Ser. No. 591,980, Nov. 4, 1966, and Ser. No. 645,471, June 12, 1967. Divided and this application June 9, 1968, Ser. No. 807,139
Int. Cl. C07d 85/48
U.S. Cl. 260—307A 25 Claims

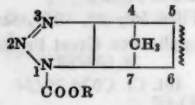
The compounds are of the class of 4-(3-mono- or dialkylaminopropylidene)-2-lower alkyl - 9,10-dihydro-4H-benzo[5,6]cyclohepta [1,2 - d]oxazoles. The compounds are useful as tranquilizers and are prepared by converting a 6,7,8,9-tetrahydro-5H-benzcycloheptен-5-one to a 2-lower alkyl-9,10-dihydro-4H-benzo[5,6]cycloheptа[1,2-d]oxazol-4-one, which is then reacted with a metallo-dialkylaminopropyl halide Grignard reagent, and dehydrating the carbinol resulting from the hydrolysis of the Grignard adduct to obtain the corresponding 4-(3-dialkylaminopropylidene)-2-lower alkyl-9,10 - dihydro-4H-benzo[5,6]cyclohepta[1,2-d]oxazole, which may then be N-dialkylated to the corresponding 3-alkylaminopropylidene-containing analog.

3,598,836
TRIAZOLINE DERIVATIVES

Hiroshi Tanida, Osaka, and Teruji Tsuji, Takatsuki-shi, Japan, assignors to Shionogi & Co. Ltd, Osaka, Japan

No Drawing. Original application Oct. 27, 1965, Ser. No. 505,400, now Patent No. 3,445,456, dated May 20, 1969. Divided and this application Sept. 18, 1968, Ser. No. 798,220
Int. Cl. C07d 55/02
U.S. Cl. 260—308 4 Claims

Compounds of the formula:



and the acid addition salts thereof, wherein R represents lower alkyl, aryl or ar(lower) alkyl and wherein the symbol ‡ represents hydrogen atoms at positions 5 and 6, a double bond between said positions or a condensed benzene ring between said 5- and 6-positions said ring being unsubstituted or substituted with one or more substituents selected from lower alkyl, lower alkoxy, halogen, amino, alkylamino, di(lower)alkylamino and cyano. The compounds are useful as intermediates for production of anti-depressants or psychomotor stimulants.

3,598,837

OLEFIN COMPLEXES OF MOLYBDENUM AND TUNGSTEN

Fausto Calderazzo and Rene Henzi, Geneva, Switzerland, assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Sept. 5, 1967, Ser. No. 665,248
Int. Cl. C07d *27/18*
U.S. Cl. 260—326.3 9 Claims

Halgen pentacarbonyl anions of Group VI transition metals, molybdenum and tungsten, of the formula

$$[MX(CO)_5]^-(M{=}Mo \text{ and } W, X{=}Cl, Br, I)$$

are reacted with active double-bond compounds, such as maleic anhydride and maleimide, and conjugated double-bond compounds, such as p-benzoquinone. The compounds are new. Also, hexacarbonyls of the same transition metals react with p-benzoquinone to give neutral complexes in which there are three quinone ligands per metal. These complexes, which are also new chemical compounds, may exist either as monomers or polymers.

3,598,838

METHOD OF PURIFYING AMINO ACIDS

Koji Toi, Yokohama-shi, Naoko Nakayama, Naotake Sato, Takekazu Akashi, and Noboru Uchiyama, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Aug. 21, 1968, Ser. No. 754,450
Claims priority, application Japan, Aug. 28, 1967, 42/55,140; Mar. 27, 1968, 43/19,883
Int. Cl. C07d *27/04;* C07c *61/00*
U.S. Cl. 260—326.3 3 Claims

Proline, glycine, alanine, valine, phenylalanine, methionine, and lysine form adducts with chlorendic acid, which are insoluble or only sparingly soluble in water, and may thereby be separated from all other amino acids which do not form insoluble chlorendic acid salts under these conditions.

3,598,839

PHENYLBENZOTHIOPHENE COMPOUNDS

James S. Kaltenbronn, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed June 30, 1969, Ser. No. 837,917
Int. Cl. C07d *63/22;* A61k *27/00*
U.S. Cl. 260—330.5 7 Claims

Novel phenylbenzo[b]thiophenes (I) having pharmacological activity are provided by reduction of the corresponding acetic acids, acetonitriles, acetamides or N-acylethylamines and by N-alkylation of the corresponding primary and secondary amines

I

where one of R_1 and R_2 is

$$-CH(R_3)CH_2OH, \quad -CH(_3)CH_2NH_2$$

$$-CH(R_3)CH_2NH(\text{lower alkyl})$$

or

$$-CH(R_3)CH_2N(\text{lower alkyl})_2$$

and the other is phenyl, fluorophenyl or chlorophenyl, R_1 being attached at position 3 or 4 and R_3 is hydrogen or lower alkyl.

The compounds have anti-inflammatory properties and are useful agents in dosage form for treating inflammation.

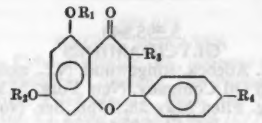
3,598,840

3-ACETOXY-FLAVANONES AND THEIR PRODUCTION

Bernard Majoie, Dijon, France, assignor to Societe de Recherches Industrielles, Dijon, France

No Drawing. Filed July 25, 1968, Ser. No. 747,501
Claims priority, application France, July 26, 1967, 862; Feb. 15, 1968, 883
Int. Cl. C07d *7/20*
U.S. Cl. 260—345.2 8 Claims

This disclosure concerns compounds of the general formula:



where

$R_1{=}R_2{=}{-}H, -CH_3, -C_2H_5,$
$R_3{=}{-}OCOCH_3, -OH,$
$R_4{=}{-}H, -OH, -OCH_3, -OC_2H_5, -Cl,$

and alkali metal salts thereof. These compounds show anti-nephrotoxic properties. These compounds are characterized chemically by the presence of a hydroxy or acetoxy radical in the 3-position. The invention is also concerned with methods of synthesis which consist successively in condensing acetonitrile and phloroglucinol or its alkoxy derivative in ether in the presence of zinc chloride to obtain trihydroxy-acetophenone or its alkoxy derivative; condensing this product with benzaldehyde or its para-hydroxy or alkoxy derivatives to obtain 5,7,4′-trihydroxy-flavanone. Alternately the product obtained in the first step can be condensed with p-chloro-benzaldehyde to obtain 5,7-dihydroxy chloroflavanone or its alkoxy derivatives. On the product obtained is introduced an acetoxy radical in the 3-position by maintaining this compound boiling under reflux in ethyl alcohol in the presence of iodine and of a metallic acetate such as an acetate of silver, lead, sodium or zinc in order to obtain 3-acetoxy-5,7,4′-trihydroxy-flavanone or its derivatives. The product obtained is saponified with dilute sodium to obtain 3,5,7,4′-tetra-hydroxy-flavanone or its derivatives.

3,598,841

PROCESS FOR CONVERTING TANGERETIN TO NOBILETIN

Lyle J. Swift, Winter Haven, Fla., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Mar. 27, 1969, Ser. No. 811,253
Int. Cl. C07d *7/34*
U.S. Cl. 260—345.5 1 Claim

A process is provided for converting tangeretin to nobiletin, the latter being effective against a fungus that affects citrus seedlings.

3,598,842

PROCESS FOR THE PREPARATION OF ALKYLATED 2,3-DIHYDROBENZO-FURANS AND ALKYLATED 2,3-DIHYDRO-NAPHTHOFURANS

Joseph C. Martini, Houston, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 731,271, May 22, 1968. This application Mar. 24, 1969, Ser. No. 809,947
Int. Cl. C07d *5/36*
U.S. Cl. 260—346.2 15 Claims

A process is defined for the preparation of cyclic ethers by the condensation of phenolics, such as phenol, with certain aldehydes containing tertiary carbon atoms, such as isobutyraldehyde, using a strong acid catalyst, such as H_2SO_4. The single ring phenolics produce alkylated

coumaran type cyclic ethers such as 2,2-dimethyl coumaran. The two condensed ring phenolics, such as beta-naphthol, produce the alkylated naphthofuran type cyclic ethers. Beta-naphthol is unique in also producing 3,4,5,6-dinaphtho-2-isopropylpyran, a composition of matter useful as an ultraviolet light absorber. The aqueous hydrogen halides are unique in promoting the selective condensation of meta-cresol with isobutyraldehyde from admixture with para-cresol to allow for the separation and recovery of substantially pure para-cresol.

3,598,843
GLYCIDAMIDES
William E. Adcock, Ridgewood, N.J., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed May 28, 1968, Ser. No. 732,559
Int. Cl. C07d *1/20*
U.S. Cl. 260—348 **12 Claims**

2-phenylglycidamides such as 3-chloro-2-(2,4-dichlorophenyl)glycidamide, are described. The compounds have utility in the polymer field and also possess useful biological activity.

3,598,844
AZIDOCINNAMIC ALDEHYDES
Hans Ruckert, Wiesbaden, and Walter Lüders, Neu-Isenburg, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
No Drawing. Continuation-in-part of application Ser. No. 741,296, July 1, 1968. This application Jan. 29, 1970, Ser. No. 6,944
Claims priority, application Germany, July 6, 1967, P 16 43 322.0
Int. Cl. C07c *117/00*
U.S. Cl. 260—349 **1 Claim**

Azidocinnamic aldehydes, which may be nucleo- or side-chain-substituted are prepared either by reacting azidobenzaldehydes with vinyl alkyl ethers or by reacting azidoacetophenone with a mixture of phosphorus oxychloride and dimethyl formamide. The azidocinnamic aldehydes can be converted to azidochalkones by condensation with methyl aryl ketones which azidochalkones are useful as photo-sensitive materials.

3,598,845
INTERMEDIATES IN SYNTHESIS OF 16-DEHYDROPROGESTERONE
William S. Johnson, Portola Valley, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,092
Int. Cl. C07c *169/00, 169/20*
U.S. Cl. 260—397 **6 Claims**

dl-pregna-4,16-diene-3,20-dione (16 - dehydroprogesterone) and *dl*-17-formylandrosta-4,16-diene-3,20-dione are prepared by a series of reactions starting with 1-methylcyclopropyl methyl ketone.

3,598,846
METHOD FOR HYDROLYZING TETRACHLOROALKANES
Ryoichi Wakasa, Kazuo Saotome, and Toshiaki Yamasaki, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
No Drawing. Continuation of application Ser. No. 658,045, Aug. 3, 1967, which is a continuation-in-part of application Ser. No. 359,776, Apr. 14, 1964. This application Aug. 12, 1969, Ser. No. 850,340
Int. Cl. C11c *3/00*
U.S. Cl. 260—408 **6 Claims**

A method for producing in high yield ω-chlorocarboxylic acids of the formula $Cl(CH_2)_nCOOH$, wherein n is an even integer between 10 and 14 inclusive. Said method comprises simultaneously contacting a tetrachloroalkane of the formula $Cl(CH_2)_nCCl_3$, wherein n is as defined above with nitric acid or fuming nitric acid, particularly fuming nitric acid of specific gravity greater than 1.50, in the presence of oxygen at a temperature of 40°–80° C. to form a mixture and passing gaseous nitrogen dioxide in an amount of at least ⅓ of the weight of the nitric acid used through said mixture to convert the tetrachloroalkane to the corresponding ω-chlorocarboxylic acid.

3,598,847
METHOD FOR MAKING MOLYBDENUM NAPHTHENATE PRODUCT
Melvin L. Larson, Royal Oak, Mich., assignor to American Metal Climax, Inc.
No Drawing. Filed Aug. 12, 1968, Ser. No. 751,740
Int. Cl. C07f *11/00*; C10m *1/24*
U.S. Cl. 260—429 **7 Claims**

An improved process for synthesizing molybdenum naphthenate product employing molybdenyl bis-acetylacetonate and naphthenic acid which are reacted at an elevated temperature producing the molybdenum naphthenate product in comparatively high yields suitable for commercial production. The product has utility as an additive for lubricating oils.

3,598,848
GROUP VI–B TRANSITION METAL-AMINO-PHOSPHORODITHIOATES AND METHOD FOR PRODUCING SAME
Phyllis Dodds, Wysox, and Vincent Chiola, Towanda, Pa., assignors to Sylvania Electric Products Inc.
No Drawing. Filed Sept. 5, 1968, Ser. No. 757,788
Int. Cl. C07f *11/00*; C10m *1/48*
U.S. Cl. 260—429R **14 Claims**

Group VI–B transition metal-amino-phosphorodithioates, which are the reaction products of amine salts of Group VI–B oxyacids and phosphorodithioic acids, are disclosed. A process for producing the before-mentioned compounds is also disclosed that comprises contacting an acidic aqueous medium containing the Group VI–B metal source with a water-immiscible organic medium containing an alkyl amine and reacting said product with a phosphorodithioic acid and recovering the compounds of this invention. Lubricating compositions containing the compounds of this invention are also disclosed.

3,598,849
TRICYCLOHEXYLTIN ESTERS
Donald E. Bublitz, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 20, 1968, Ser. No. 761,313
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 **12 Claims**

Novel tricyclohexyltin esters wherein the ester moiety is selected from ferrocenylcarbonyloxy, pyridylcarbonyloxy, phenoxyacetoxy, chlorophenoxyacetoxy, and phenylthioacetoxy. These compounds are useful as pesticides.

3,598,850
FERROCENE POLYGLYCOLS
Fred M. Dewey, Denver, Colo., assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed June 11, 1969, Ser. No. 832,496
Int. Cl. C08g *43/00*; C10l *9/10*; C07f *15/02*
U.S. Cl. 260—439 **10 Claims**

A method for synthesizing ferrocene polyglycol copolymers which are useful as components of rocket propellant compositions. The copolymers are formed by ef-

fecting a polycondensation-reaction between (1) a bis(α-hydroxyalkyl) ferrocene, (2) a substituted dihydroxy alcohol and (3) a catalytic amount of boron trifluoride etherate.

3,598,851
CYCLIC ORGANOSILICON MATERIALS
Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Application Sept. 20, 1967, Ser. No. 679,948, which is a division of application Ser. No. 330,607, Dec. 16, 1963, now Patent No. 3,360,538. Divided and this application Jan. 23, 1970, Ser. No. 5,373
Int. Cl. C07f 7/08, 7/10
U.S. Cl. 260—448.2R 2 Claims

Organosilicon cyclics containing radicals of the formula $H(C_2F_4)_nCHR—C(R)_2—$, are useful in making solvent resistant rubber. In the above formula, R is a member selected from the class consisting of hydrogen and a lower alkyl radical, *n* is an integer equal to from 1 to 3, inclusive R′ is a member selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals, and cyanoalkyl radicals, and *m* is an integer equal to from 3 to 8, inclusive.

3,598,852
METHOD OF PREPARING ISOCYANURATE CONTAINING ORGANOSILICON MATERIALS
Abe Berger, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Original application Sept. 20, 1967, Ser. No. 669,298, now Patent No. 3,494,951. Divided and this application Aug. 15, 1969, Ser. No. 870,718
Int. Cl. C07f 7/02, 7/04
U.S. Cl. 260—448.2E 2 Claims

A method is provided for making various nitrogen-containing organosilicon compounds, such as silylorganoisocyanates, the corresponding carbamate and isocyanurates. The method involves contacting silylorganohalide and a metal cyanate in the presence of a suitable aprotic solvent. Nitrogen-containing organosilicon compounds are provided having silicon and nitrogen atoms separated by a divalent hydrocarbon radical. In instances where a urethane is desired, an appropriate aliphatic monohydric alcohol can be utilized in combination with the silylorganohalide and metal cyanate. The subject nitrogen-containing organosilicon compounds can be utilized for making silicon-organic copolymers and as treating agents for imparting water repellency to various substrates.

3,598,853
METHOD OF PREPARING AMINOISOALKOXYALKYLSILANES AND 3-(2-METHYL-3-AMINOPROPOXY) PROPYLTRIMETHOXYSILANE PRODUCED THEREBY
Norman J. Friedman, Latham, and Abe Berger and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company
No Drawing. Filed July 17, 1968, Ser. No. 745,345
Int. Cl. C07f 7/02, 7/04
U.S. Cl. 260—448.8R 7 Claims

A quaternary ammonium hydroxide type of ion exchange resin is used in a cyanoethylation type reaction between a branched chain olefinic nitrile and an unsaturated alcohol. The cyano(branched alkoxy)alkene produced is then reacted with a silane by an SiH-olefin addition reaction. The corresponding amine is made from the nitrile by hydrogenation at low pressure. One of the silanes produced by the above method, 3-(2-methyl-3-aminopropoxy)propyltrimethoxysilane, is an exceptionally valuable component in detergent resistant polishes.

3,598,854
ALKYLHYDROXYPHENYLTHIOLOALKANOATES
David Herbert Steinberg, Bronx, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Oct. 31, 1968, Ser. No. 772,368
Int. Cl. B01j 1/16; C07c 153/07
U.S. Cl. 260—455 8 Claims

Alkylhydroxyphenylthioloacyl alkanoic acid esters of mono- and polymercaptoalkanoic acid esters prepared by known thiolo esterification procedures, are stabilizers of organic material subject to oxidative deterioration.

3,598,855
CYCLIC BORATES
Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 2, 1968, Ser. No. 780,601
Int. Cl. C08g 33/18; C07d 107/02
U.S. Cl. 260—462R 6 Claims

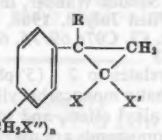
Cyclic borate of polymeric alkanolamine formed by reacting a borylating agent with a polymeric alkanolamine. The cyclic borate is used as an additive in organic substances to inhibit deterioration due to oxidation, weathering, heat or other undesired reactions.

3,598,856
t-ALKYL PENTACHLOROPHENYL CARBONATE
Masahiko Fujino, Takarazuka, Hyogo, and Chitoshi Hatanaka, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,218
Claims priority, application Japan, Apr. 20, 1967, 42/25,289
Int. Cl. C07c 69/00, 125/06; C07d 27/60
U.S. Cl. 260—463 1 Claim

The compounds t-butyl pentachlorophenyl carbonate and t-amyl pentachlorophenyl carbonate are excellent t-alkoxycarbonylating agents, especially useful in the industrial production of peptides and t-alkoxycarbonylamino compounds generally.

3,598,857
CYANOMETHYL SUBSTITUTED DERIVATIVES OF DIHALOPHENYLCYCLOPROPANE
Herman A. Bruson, Woodbridge, and Howard L. Plant, Milford, Conn., assignors to Olin Mathieson Chemical Corporation
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,932
Int. Cl. C07c 121/06, 121/66
U.S. Cl. 260—465 4 Claims

Halomethyl substituted derivatives of dihalophenylcyclopropanes having the formula:



wherein X, X′, X″ are each selected from the group consisting of chlorine, bromine, iodine, R is selected from the group consisting of hydrogen or alkyl of from 1 to 5 inclusive carbon atoms and *n* is an integer of from 1 to 2 inclusive; are prepared by reacting formaldehyde and an acid, such as hydrobromic acid, with a dichlorocarbene adduct of styrene. In the second phase the halomethyl derivatives are reacted with an alkali metal cyanide to form cyanomethyl substituted derivatives of the dihalophenylcyclopropanes. The compounds, which contain a high percentage of halogen, are useful as fire retardants for plastic materials such as polyethylene and, in addition, the cyanomethyl derivatives are valuable soil fungicides and herbicides.

3,598,858

PGE_2 AND PGE_3

Sune Bergstrom, 12 Danderydsgatan, and Jan Sjøvall, Kemiska Institutionem, Karolinska Institutet, both of Stockholm, Sweden

No Drawing. Continuation-in-part of applications Ser. No. 738,514, May 28, 1958, and Ser. No. 199,209, Apr. 9, 1962. This application June 20, 1962, Ser. No. 203,752
Claims priority, application Great Britain, Mar. 29, 1962, 12,139/62
Int. Cl. C07c *69/74*
U.S. Cl. 260—468 2 Claims

PGE_2, PGE_3, their salts and esters, free of antigens and pyrogens. PGE type compounds exhibit blood pressure lowering and smooth muscle stimulating properties.

3,598,859

N,N-DISUBSTITUTED AMINO ACID HERBICIDES

John Yates, Whistable, and David H. Payne, near Sittingbourne, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,116
Claims priority, application Great Britain, Dec. 30, 1966, 58,406/66
Int. Cl. C07c *103/30, 125/06*
U.S. Cl. 260—471 7 Claims

N,N-disubstituted amino acid derivatives such as N-benzoyl-N-(3,4-dichlorophenyl) alanine, herbicidal compositions containing them, and their use for controlling undesirable plant growth.

3,598,860

2 - [4 - (3',4' - DIPHENYLCYCLOPENTYL)-PHENOXY] LOWER ALIPHATIC MONOCARBOCYCLIC ACIDS AND ESTERS THEREOF

Rudolf G. Griot, Florham, N.J., assignor to Sandoz-Wander, Inc.

No Drawing. Filed July 8, 1968, Ser. No. 743,039
Int. Cl. C07c *39/12, 65/00, 69/76*
U.S. Cl. 260—473 3 Claims

The invention relates to 2 - [4-(3',4'-diphenylcyclopentyl)phenoxy] lower aliphatic monocarbocyclic acids and the corresponding lower alkyl esters, and to a process for their production. The compounds are useful as hypolipidemics.

3,598,861

2-(5'-PHENYL-m-TERPHENYL - 4 - YLOXY) LOWER ALIPHATIC MONOCARBOCYCLIC ACIDS AND ESTERS THEREOF

Rudolf G. Griot, Florham, N.J., assignor to Sandoz-Wander, Inc.

No Drawing. Filed July 8, 1968, Ser. No. 743,040
Int. Cl. C07c *69/76, 65/00*
U.S. Cl. 260—473 3 Claims

The invention relates to 2 - (5'-phenyl-m-terphenyl-4-yloxy) lower aliphatic monocarbocylic acids and the corresponding lower alkyl esters, and to a process for their production. The compounds are useful as hypolipidemics.

This invention relates to derivatives of aliphatic acids.

3,598,862

2 - [4 - (3',5' - DIPHENYLCYCLOHEXYL) - PHENOXY]LOWER ALIPHATIC MONOCARBOCYCLIC ACIDS AND ESTERS THEREOF

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc.

No Drawing. Filed July 8, 1968, Ser. No. 743,056
Int. Cl. C07c *69/76, 65/00, 39/12*
U.S. Cl. 260—473 3 Claims

The invention relates to 2-[4-(3',5'-diphenylcyclohexyl)-phenoxy] lower aliphatic monocarbocylic acids and the corresponding lower alkyl esters, and to a process for their production. The compounds are useful as hypolipidemics.

3,598,863

PREPARATION OF HYDROXYBENZOPHENONE BENZOATE

Edwin J. Strojny, Midland, and James R. Dewald, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 10, 1968, Ser. No. 735,569
Int. Cl. C07c *69/78, 67/00*
U.S. Cl. 260—476 8 Claims

The benzoate of hydroxybenzophenone is obtained as a principal reaction product by heating a mixture of benzoic anhydride, cupric benzoate, at least one of iron, zinc, cobalt, or magnesium benzoate, and optionally a small amount of free benzoic acid at 220–320° C. in the presence of molecular oxygen. The product can be hydrolyzed to make hydroxybenzophenone, a useful chemical intermediate and fungicide.

3,598,864

BISPHENOL POLY(ESTER-AMIDES)

John R. Caldwell and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 20, 1969, Ser. No. 851,727
Int. Cl. C08g *20/30*
U.S. Cl. 260—476Z 6 Claims

Poly(ester-amide) copolymers derived from bisphenols, aromatic dicarboxylic acids and aromatic amino acids have been found to exhibit improved solvent resistance, stress cracking resistance and also increased stiffness, tensile strength, hardness and heat distortion temperature.

3,598,865

POLYGLYCOSIDES AND PROCESS OF PREPARING MONO AND POLYGLYCOSIDES

Baak W. Lew, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed Feb. 7, 1968, Ser. No. 703,539
Int. Cl. C07c *47/18*
U.S. Cl. 260—210R 14 Claims

Glycosides are prepared by reacting a monosaccharide, or a compound hydrolyzable to a monosaccharide, with a monohydric alcohol having from 8 to 25 carbon atoms, in the presence of an acid catalyst selected from the group consisting of sulfuric acid, hydrochloric acid, phosphoric acid, phosphorous acid, toluene-sulfonic acid, and boron trifluoride, and in the presence of a latent solvent selected from the group consisting of primary and secondary alcohols having from 3 to 5 carbon atoms. The glycosides of the present invention are advantageously used for a variety of purposes, such as gelling agents, lubricants, wetting agents, dyeing assistants, textile softeners and food emulsifiers.

3,598,866

ADDUCTS OF ALKENYL ISOCYANATES WITH BISPHENOL A AND DERIVATIVES THEREOF

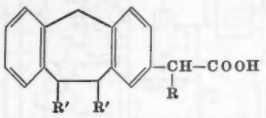
Robert M. Nowak, James T. K. Woo, and Dietrich H. Heinert, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 16, 1969, Ser. No. 833,714
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 9 Claims

Vinyl isocyanate and isopropenyl isocyanate react with Bisphenol A, halogenated Bisphenol A, and the alkylene oxide addition products thereof to form the corresponding bis(N-alkenylcarbamate) esters. These divinyl compounds are useful monomers and crosslinking agents.

3,598,867
DIBENZOCYCLOHEPTA-TRIENE AND -DIENE DERIVATIVES
Jean Clement Louis Fouche, Bourg-la-Reine, France, assignor to Rhone-Poulenc, S.A., Paris, France
No Drawing. Filed Oct. 16, 1967, Ser. No. 675,296
Claims priority, application France, Oct. 24, 1966, 81,341
Int. Cl. C07c *63/44*
U.S. Cl. 260—515 **5 Claims**

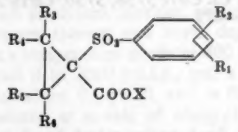
Dibenzocycloheptatriene and dibenzocycloheptadiene derivatives of the formula:



wherein R is hydrogen or methyl and the symbols R′ each represent hydrogen or together form a single bond, and pharmaceutically-acceptable salts thereof, are useful as anti-flammatory agents.

3,598,868
1-(PHENYLSULFONYL)CYCLOPROPANE-CARBOXYLIC ACIDS
Donald J. Cram, Los Angeles, Calif., and Aleksander Ratajczak, Lodz, Poland, assignors to The Regents of the University of California, Berkeley, Calif.
No Drawing. Filed Mar. 12, 1968, Ser. No. 712,381
Int. Cl. C07c *147/06*
U.S. Cl. 260—515 **14 Claims**

The invention is a new group of compounds:



wherein X is hydrogen or a non-toxic cation, and wherein R_1, R_2, R_3, R_4, R_5, and R_6 are hydrogen or alkyl. These compounds are useful as chelating agents, resolving agents, intermediates to produce insecticides, and as non-caloric sweeteners.

3,598,869
OXIDATION OF CYCLOHEXANE TO NYLON PRECURSORS
Peter J. Volpe and William J. Humphrey, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 519,296, Jan. 7, 1966. This application Dec. 5, 1967, Ser. No. 687,997
Int. Cl. C07c *55/14*
U.S. Cl. 260—533C **5 Claims**

A reaction product consisting of (a) cyclohexanone and cyclohexanol (KA) and (b) a mixture of carboxylic acid derivatives of cyclohexane comprising predominantly hydroxycaproic acid and adipic acid (COP acids), in which the ratio of COP acids to KA is particularly suitable for subsequent conversion to nylon salt by converting the COP acids to hexamethylene-diamine and the KA to adipic acid, is obtained by oxidizing cyclohexane in the liquid phase at a conversion per pass between 14% and 30%, with a reaction retention time between about 6 minutes and 80 minutes, and in the presence of a catalyst comprising at least one of the group consisting of cobalt and chromium, the conversion per pass and the catalyst composition being coordinated one with the other to attain the desired ratio of COP acids to KA in the oxidation product. The chromium:cobalt ratio in the oxidation catalyst is a significant independent variable which can be adjusted to control the COP acids:KA ratio at a given cyclohexane conversion rate.

3,598,870
METHOD OF MAKING THE TRIACID HALIDES OF PHOSPHONOACETIC ACID
William A. Cilley, Springfield Township, and Oscar T. Quimby, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 27, 1968, Ser. No. 716,339
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 **8 Claims**

The triacid chloride and bromide of phosphonoacetic acid are prepared by a two step synthesis comprising reacting phosphorus pentachloride or bromide and ketene together to obtain a pentahalophosphorus derivative and thereafter converting the pentahalophosphorus derivative to the triacid chloride or bromide of phosphonoacetic acid by adding thereto SO_2 or about a stoichiometric amount of water.

3,598,871
MANUFACTURE OF 1,6-DIALKYLBIUREAS
Charlotte Marie Kraebel, Alexandria, Va., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Aug. 6, 1969, Ser. No. 848,105
Int. Cl. C07c *133/02*
U.S. Cl. 260—554 **7 Claims**

1,6-dialkylbiureas are prepared by the reaction of hydrazine in a solvent with 2.0 to 5.0 moles of a corresponding 1,3-dialkylurea in the presence of from 0.05 to 14.0 moles of water and from 0.03 to 1.2 moles of an acid, by heating the solution in the range 100° C. to 170° C. Useful acids include hydrochloric, sulfuric, phosphoric, p-toluene sulfonic, benzene sulfonic and naphthalene sulfonic acids. The preferred solvents are high boiling ethereal solvents such as diglyme and dioxane. By-product alkylamine is reacted with urea to produce additional 1,3 - dialkylurea, which is recycled to the process.

3,598,872
O-CHLORINATED-PHENOXYACETYL-N,N-DIETHYLHYDROXYLAMINE
Rudi F. W. Rätz, deceased, late of Hamden, Conn., by Margot I. H. Rätz, executrix, Hamden, Conn., and Miriam J. Gruber, Dover, N.J., assignors to The Ansul Company
No Drawing. Filed Apr. 8, 1968, Ser. No. 719,778
Int. Cl. C07c *97/10*
U.S. Cl. 260—568 **4 Claims**

Diethylamino esters of various chlorinated phenoxyacetic acids are prepared by the reaction of chlorinated phenoxyacetyl chlorides with N,N-diethylhydroxylamine in diethyl ether and in the presence of an acid acceptor. These compounds are highly effective herbicides.

3,598,873
MEANS FOR PURIFYING LOW MELTING POINT SOLIDS
Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Apr. 27, 1967, Ser. No. 634,352
Int. Cl. C07c *39/04*
U.S. Cl. 260—621A **8 Claims**

A continuous method for purifying low melting point solids by heating the solid material into a molten state and distributing it sequentially into a series of separate elongated moving zones which are externally heated by spaced heater means such that alternate heating and cooling takes place on the molten material. The result is a "molten wave" which, in effect, travels opposite to the direction of movement of the series of moving zones so that withdrawal may be in two stages. In a withdrawal stage for each zone, an impure stream is separately with-

drawn and a substantially purified stream separately withdrawn. Each emptied zone moves along to again pass through the entire cyclic operation.

3,598,874

PREPARATION OF CHLOROHYDRINS BY REACTING HYPOCHLOROUS ACID AND LONG-CHAIN OLEFINS

Richard K. Kloss, Forest Park, Gene W. Claybaugh, Green Township, Hamilton County, and David D. Whyte, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 9, 1969, Ser. No. 823,476
Int. Cl. C07c *31/34*
U.S. Cl. 260—634 12 Claims

A process for preparing high molecular weight chlorohydrins comprises reacting dilute solutions of long-chain olefins with dilute hypochlorous acid in a 2-phase reaction for short reaction times to achieve low olefin conversions which minimize formation of undesirable by-products.

3,598,875

PRODUCTION OF DIHALOGEN ETHANES

Herbert Jenkner, Cologne-Deutz, Germany, assignor to Chemische Fabrik Kalk G.m.b.H., Cologne-Kalk, Germany

No Drawing. Filed Oct. 7, 1966, Ser. No. 584,962
Claims priority, application Germany, Oct. 12, 1965, C 37,131
Int. Cl. C07c *17/00*
U.S. Cl. 260—658 4 Claims

A process of producing 1-chloro-2-bromoethane by simultaneously introducing hydrogen bromide and vinyl chloride into 1-chloro-2-bromoethane in the presence of a peroxide, air or oxygen and initiating and carrying out the reaction at 0–80° C.

3,598,876

SELECTIVE HALOGENATION OF HYDROCARBONS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 411,071, Nov. 13, 1964. This application Nov. 13, 1967, Ser. No. 684,595
Int. Cl. C07c *17/10*
U.S. Cl. 260—660 10 Claims

The selective mono-halogenation of saturated hydrocarbons is effected by charging a saturated hydrocarbon and a halogenating agent to a thermal diffusion zone in which opposing walls of the zone are maintained at a temperature differential from about 100° to about 200° C. The hydrocarbon and halogenating agent will react therein to form mono- and poly-halogenated hydrocarbons. The mono-halogenated hydrocarbon will be removed from an intermediate point in the zone while the poly-halogenated hydrocarbon will be removed from a lower portion of the zone.

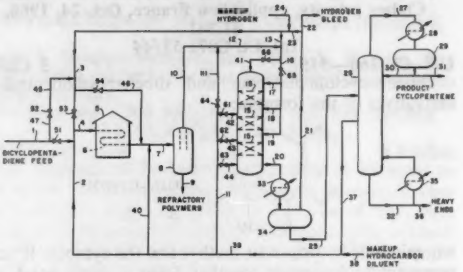
3,598,877

CYCLODIOLEFIN HYDROGENATION

Eugene B. Fountain, Berkeley, and Durga S. Ambwani, Oakland, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed June 5, 1970, Ser. No. 43,878
Int. Cl. C07c *3/26*
U.S. Cl. 260—666A 8 Claims

Dicyclopentadiene is depolymerized to monomeric cycyopentadiene, and the monomer selectively hydrogenated to cyclopentene with high overall selectivity by thermally depolymerizing the dicyclopentadiene in admixture with hydrogen and an hydrocarbon diluent at a sufficiently high pressure to allow introduction of the cracked products directly into the hydrogenation reactor, and then selectively hydrogenating the cyclopentadiene to



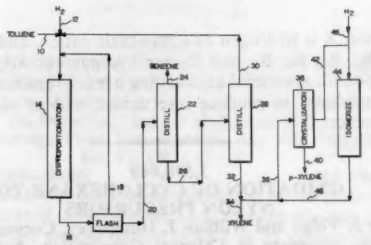
cyclopentene in the presence of an hydrogenation catalyst, such as sulfided nickel oxide.

3,598,878

ALKYL TRANSFER OF ALKYL AROMATICS WITH VANADIUM ON ZEOLITES

Stephen M. Kovach and Ronald A. Kmecak, Ashland, Ky., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Dec. 19, 1968, Ser. No. 785,206
Int. Cl. C07c *3/58, 3/50;* C01b *33/28*
U.S. Cl. 260—672 8 Claims



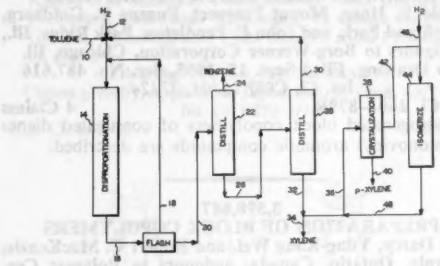
A process for the alkyl transfer of alkyl aromatics including contacting an alkyl aromatic feed material, such as toluene, with a catalyst comprising a Group V metal, such as vanadium, deposited on a zeolite base at a temperature of about 700 to 1100° F., a pressure of about 0 to 2000 p.s.i.g., and a liquid hourly space velocity of about 0.1 to 10, and in the presence of hydrogen introduced at a rate of about 1 to 10 moles hydrogen per mole of hydrocarbon feed. Promoters selected from Group I, Group II, Group IV, and the rare earth metals of the Periodic System may be added to the catalyst. Deactivated catalyst may be periodically rejuvenated by discontinuing the introduction of aromatic feed material and purging with hydrogen and the catalyst can be reactivated by calcination in an atmosphere such as air. Where toluene is the feed, the alkyl transfer product may be distilled to separate benzene, toluene and xylenes, the toluene may be recycled to the alkyl transfer step, the xylenes may be crystallized to separate para-xylene from the remaining xylenes, the mother liquor from the crystallization step may thereafter be isomerized to readjust the para-xylene content and the product of the isomerization may be recycled to the crystallization zone.

3,598,879

ALKYL TRANSFER OF ALKYL AROMATICS WITH GROUP I–A, II–A, IV, OR RARE EARTH METALS ON BORIA ALUMINA

Ronald A. Kmecak and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Dec. 19, 1968, Ser. No. 785,232
Int. Cl. B01j 11/06; C07c 3/58, 15/08
U.S. Cl. 260—672 12 Claims



A process for the alkyl transfer of alkyl aromatics including contacting an alkyl aromatic feed material, such as toluene, with a catalyst comprising a metal of Group I–A, such as potassium, rubidium, cesium, etc., Group II–A, such as calcium, magnesium, strontium, etc., Group IV, such as tin, lead, titanium, zirconium, etc., or rare earth metals, such as cerium, thorium, etc., of the Periodic System or mixtures thereof and boria deposited on an alumina base at a temperature of about 800 to 1100° F., a pressure of about 0 to 2000 p.s.i.g., and a liquid hourly space velocity of about 0.1 to 10, and in the presence of hydrogen introduced at a rate of about 1 to 10 moles hydrogen per mole of hydrocarbon feed. Promoters selected from Group I, Group II, Group IV, and the rare earth metals of the Periodic System may be added to the catalyst. Deactivated catalyst may be periodically rejuvenated by discontinuing the introduction of aromatic feed material and purging with hydrogen and the catalyst can be reactivated by calcination in an atmosphere such as air. Where toluene is the feed, the alkyl transfer product may be distilled to separate benzene, toluene and xylenes, the toluene may be recycled to the alkyl transfer step, the xylenes may be crystallized to separate para-xylene from the remaining xylenes, the mother liquor from the crystallization step may thereafter be isomerized to readjust the para-xylene content and the product of the isomerization may be recycled to the crystallization zone.

3,598,880

METHOD FOR PRODUCING ISOPRENE

Yoshiki Komiyama and Akira Tasaka, Ibaragi-shi, Japan, assignors to Sumitomo Chemical Co., Ltd.

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,777
Claims priority, application Japan, Sept. 7, 1967, 42/57,648; Sept. 12, 1967, 42/58,857
Int. Cl. C07c 11/18
U.S. Cl. 260—680R 13 Claims

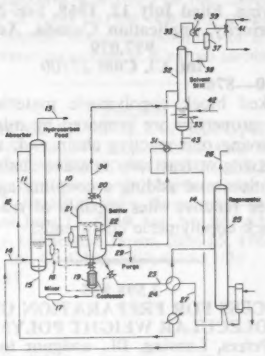
Propylene is reacted with benzene in the presence of an alkylation catalyst. The resultant isopropylbenzenes having 1 to 3 isopropyl groups are reacted with ethylene in the presence of an alkali metal and a promotor. The resulting t-amyl-benzenes having 1 to 3 t-amyl groups are subjected to silica-catalyzed thermal decomposition to give methylbutenes and benzene which can be recycled to the step (1). The methylbutenes are dehydrogenated in the presence of a dehydrogenation catalyst to obtain isoprene. A high yield of isoprene is achieved. The benzene can be recycled without any significant consumption.

3,598,881

PROCESS FOR REMOVING ACID GASES FROM CRACKED GASES CONTAINING DIOLEFINS

Ludwig Kniel, Scarsdale, N.Y., and Benjamin J. Luberoff, Summit, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Oct. 17, 1968, Ser. No. 768,303
Int. Cl. C07c 3/00, 7/00
U.S. Cl. 260—683 17 Claims



Process for removing dienes which are carried into an aqueous amine absorption solution employed for removing acid gases from a gaseous hydrocarbon wherein the rich aqueous amine solution is intimately mixed with a hydrocarbon solvent, prior to introducing the rich amine solution into the amine regenerator, to remove the dienes therefrom. The mixture is separated into a hydrocarbon phase, containing essentially all of the dienes and an aqueous amine phase, and the aqueous amine phase passed to the amine regenerator. In this manner, polymerization problems caused by the presence of dienes in the amine absorption system are essentially eliminated.

3,598,882

BLOCK COPOLYESTERS OF LINEAR SATURATED POLYESTERS AND POLYBUTADIENE-DIOLS

Ludwig Brinkmann and Helmut Frohlich, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,014
Claims priority, application Germany, Oct. 12, 1967, F 53,754
Int. Cl. C08f 29/10; C08g 17/06, 39/10
U.S. Cl. 260—873 9 Claims

Block copolyesters of linear saturated polyesters and polybutadiene-diol for the manufacture of shaped articles having a very high impact strength.

3,598,883

POLYVINYL ALCOHOL COMPOSITION

Hiroshi Nakamura, Uto-shi, Kumamoto-ken, and Akira Saito, Kumamoto-shi, Kumamoto-ken, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaki-shi, Japan

No Drawing. Filed Mar. 18, 1969, Ser. No. 817,350
Claims priority, application Japan, Mar. 25, 1968, 43/18,949; Feb. 10, 1969, 44/9,872
Int. Cl. C08f 29/26, 29/30
U.S. Cl. 260—874 5 Claims

This invention is a polyvinyl alcohol composition consisting essentially of a polyvinyl alcohol prepared by hydrolyzing a polyvinyl ester in presence of an alkaline catalyst and about 0.1% to about 5% by weight based

upon the weight of polyvinyl alcohol of additive which is the product obtained by hydrolyzing polyvinyl acetate in the presence of an acidic catalyst in an alcoholic solution until about 20% to about 70% molar concentration of acetyl groups of polyvinyl acetate are hydrolyzed.

3,598,884
CROSS-LINKING OF POLYMERS
Yung-Kang Wei, Sarnia, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada
No Drawing. Filed July 12, 1968, Ser. No. 744,301
Claims priority, application Canada, Aug. 4, 1967, 997,079
Int. Cl. C08f *27/00*
U.S. Cl. 260—876 **5 Claims**

Cross-linked block copolymeric materials with good elastomeric properties are prepared by mixing block copolymers having one reactive chain end, with block copolymers having at least two reactive chain ends, preferably in solution, and adding a coupling agent which has at least three reactive sites capable of reacting with the reactive block copolymeric chain ends.

3,598,885
PROCESS FOR PREPARATION OF LOW MOLECULAR WEIGHT POLYMERS
Edwin F. Peters, Lansing, Ill., assignor to Standard Oil Company, Chicago, Ill.
No Drawing. Filed July 11, 1968, Ser. No. 743,919
Int. Cl. C08f *1/88, 15/00*
U.S. Cl. 260—878 **3 Claims**

Low molecular weight polymers are prepared by polymerization of 1-olefins through methods which lead to relatively thermally stable polymers of high molecular weight which are intimately mixed with relatively thermally unstable polymers to produce an admixture of the two polymers which is then subjected to thermal cracking, following which a lower molecular weight polymer cracked from the relatively stable high molecular weight polymer can be recovered. A desirable method for obtaining the intimate admixture is preparation of the high molecular weight polymer in a reaction system containing the relatively thermally unstable polymer.

3,598,886
HYDROGENATED BLOCK COPOLYMERS
Donald F. Hoeg, Mount Prospect, Eugene P. Goldberg, Highland Park, and John F. Pendleton, Park Ridge, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
No Drawing. Filed Sept. 15, 1965, Ser. No. 487,616
Int. Cl. C08f *15/04, 27/24*
U.S. Cl. 260—879R **4 Claims**

Hydrogenated block copolymers of conjugated dienes and monovinyl aromatic compounds are described.

3,598,887
PREPARATION OF BLOCK COPOLYMERS
Jules Darcy, Yung-Kang Wei, and Robert C. MacKenzie, Sarnia, Ontario, Canada, assignors to Polymer Corporation Limited, Sarnia, Ontario, Canada
No Drawing. Filed Dec. 23, 1966, Ser. No. 604,165
Claims priority, application Canada, Feb. 26, 1966, 953,311
Int. Cl. C08d *5/02;* **C08f** *1/88, 15/04*
U.S. Cl. 260—879 **3 Claims**

A chemical process for making block copolymers, which includes the steps of preparing a living block copolymer by anionic polymerization, e.g. using a lithium hydrocarbyl as initiator, and reacting the living block copolymer with either carbon dioxide, carbonyl sulphide or carbon disulphide to couple the block copolymer molecules through their live ends.

ELECTRICAL

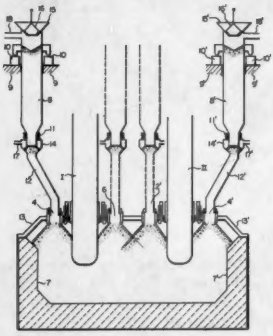
ERRATUM

For Class 424—88 see:
Patent No. 3,599,150

3,598,888
ELECTRIC SMELTING FURNACE

Yoshinosuke Tada, 33 Kasugano-cho, Minemi-ku, Minami-ku, Nagoya, Aichi Prefecture; Yasunobu Hosoi, 12-53 Ohaza Kagiya Aza Mitsuike, Yokosuka-cho, Chita District, Aichi Prefecture, and Fukio Katsumata, 53 Ohaza Kagiya Aza Gohchu, Yokosuka-cho, Chita District, Aichi Prefecture, all of, Japan

Filed Oct. 3, 1969, Ser. No. 863,470
Claims priority, application Japan, Oct. 3, 1968, 43/71492
Int. Cl. F27d *3/10*
U.S. Cl. 13—33 **2 Claims**

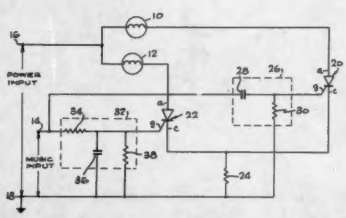


A three-phase electric smelting furnace having three electrodes arranged to form the apices of a triangle, and having material chargers. Each electrode has a plurality of the material chargers exclusively and operatively connected thereto. The lower end openings of the material chargers for each electrode are disposed along a concentric circle in symmetrical spacing with each other. The lower end openings of different groups of material charger for different electrodes are also disposed symmetrically with respect to the groups. Each material charger has a means for measuring or measuring and recording the change in the quantity of the materials therein. It is possible to attach a pretreating means to the material chargers for preheating, drying, calcining, or prereducing the materials.

3,598,889
MUSIC FREQUENCY SELECTOR CIRCUIT

Henry N. Switsen, 2723 Kelton Ave., Los Angeles, Calif.

Filed May 27, 1970, Ser. No. 041,024
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **6 Claims**

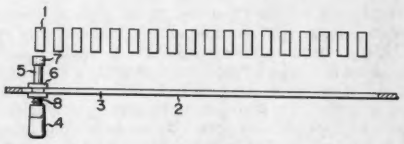


A circuit for selectively energizing one of several different colored lights in accordance with the frequency of music being played, which prevents energization of all the lights by loud music passages. The circuit includes a silicon controlled rectifier (SCR) for each light, each SCR having an anode connected through the light to one terminal of a power source, a cathode connected through a common bias resistor to the other terminal of the power source, and a gate connected through a filter to the music source to allow only a certain frequency range of music to raise the gate potential high enough to turn on the SCR. The common bias resistor increases the effective selectivity of the filters, because as soon as one SCR turns on, the resulting voltage across the common bias resistor raises the potential of all of the SCR cathodes to prevent any other SCR's from turning on.

3,598,890
ELECTRONIC MUSICAL INSTRUMENT WITH MAGNETO-SENSITIVE ELEMENTS AND MOVABLE PERMANENT MAGNET PROVIDING GLISSANDO

Syoichi Suzuki, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 23, 1969, Ser. No. 835,632
Claims priority, application Japan, June 25, 1968, 43/53404
Int. Cl. G10h *1/02;* **G10c** *3/20*
U.S. Cl. 84—1.17 **10 Claims**

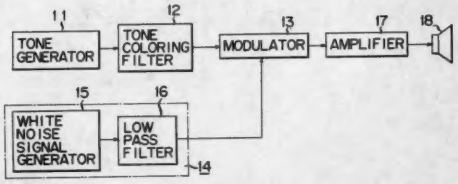


A device producing a glissando effect includes a plurality of magneto-sensitive elements arranged in a row in accordance with the respective notes of a musical scale. A permanent magnet is movable along the row of magneto-sensitive elements so as to energize the corresponding elements by its displacement to produce musical notes, the movement of the magnet being controllable at the control panel of the electronic musical instrument.

3,598,891
MUSICAL TONE-FORMING CIRCUITRY INCLUDING FILTER AND RANDOM NOISE MODULATION

Takeshi Adachi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 23, 1969, Ser. No. 835,516
Claims priority, application Japan, June 25, 1968, 43/43,743
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.24 **6 Claims**

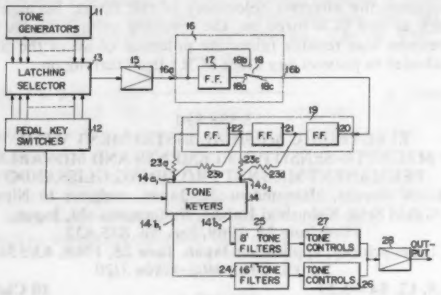


A whistle or grass reed sound is simulated by an electronic musical circuitry comprising a portamento-type oscillator, a tone coloring filter for providing a tone signal having predetermined harmonics as well as a fundamental, a noise generator, a low-pass filter for deriving frequency components below 30 Hz from a noise signal output of the noise generator, and a modulator for amplitude modulating the tone signal from the tone coloring filter with the noise signal components of less than 30 Hz from the low-pass filter.

3,598,892
CONTROLED SWITCHING OF OCTAVES IN AN ELECTRONIC MUSICAL INSTRUMENT

Maki Yamashita, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Oct. 13, 1969, Ser. No. 865,830
Claims priority, application Japan, Oct. 14, 1968, 43/74514
Int. Cl. G10h *5/00, 1/00*
U.S. Cl. 84—1.01 7 Claims

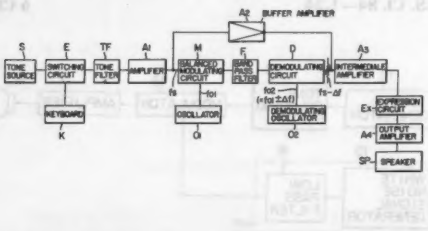


A pedal tone section of an electronic musical instrument comprises tone generators of an octave, pedal keys of an octave having associated key switches, a latching selector operated by the key switches and sustainingly selecting one signal out of signals of the tone generators, an octave shifter including a through line and a binary divider selectively operated by a player, the octave shifter providing an output which is either a divided or nondivided signal of the latching selector output. A frequency divider further divides the octave shifter output and a pedal tone signal is generated. Preferably, manipulation of a knee lever operates the octave shifter to shift the tone pitch by an octave and as a result the compass of the pedal keyboard is extensible upward or downward without increasing the number of the pedal keys.

3,598,893
TREMOLO EFFECT PRODUCING DEVICE

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 9, 1970, Ser. No. 044,751
Claims priority, application Japan, June 27, 1969, 44/50,881
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 2 Claims

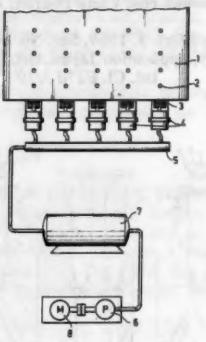


A tremolo or chorus effect can be obtained by a tremolo effect producing device which comprises a balanced modulator for modulating a signal having a specific frequency with a musical sound signal, a band-pass filter for obtaining a single-band signal of the output of the balanced modulator, a demodulating circuit for demodulating the single sideband signal employing a signal the frequency of which is shifted from the above-mentioned specific frequency by a predetermined quantity and a buffer amplifier which amplifies the above-mentioned sound signal in a buffering manner, output signal from the demodulating circuit and the output signal from the buffer amplifier being thereafter mixed together.

3,598,894
APPARATUS FOR ACTIVATING THE STOP SLIDES OF ORGANS

Karl Michel, Tauberrettersheim, and Franz Heissler, Markelsheim, both of, Germany, assignors to Herman L. Schlicker, Buffalo, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,708
Claims priority, application Germany, Aug. 19, 1968, P 17 97 122.1
Int. Cl. G10b *3/10*
U.S. Cl. 84—338 10 Claims

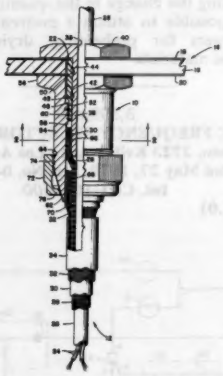


An apparatus for activating stop slides in the air chambers of an organ has air motors each engaging a piston connected to a slide, said piston being moved within a pressure cylinder by the action of a pressure means.

3,598,895
CONNECTOR FOR DOUBLE-SHIELDED CABLE

Stuart M. Garland, Morton Grove, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 6, 1970, Ser. No. 25,774
Int. Cl. H05k *9/00;* H02g *15/08*
U.S. Cl. 174—35 C 7 Claims



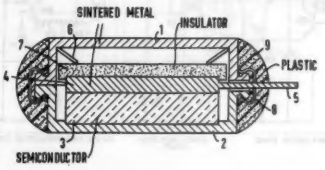
A connector assembly for connecting a double-shielded cable to a double-shielded RFI box employs an inner tubular conductive member for extending through an aperture in the box to connect a first shield of the cable to the inner shield of the box. An insulating ring is mounted on the inner member and an outer tubular conductive member is mounted on the ring. The second shield of the cable and the outer shield of the box are connected to the outer conductive member.

3,598,896

ENCAPSULATED SEMICONDUCTOR DEVICE WITH PARTS FORMED OF SINTER METAL AND PLASTIC

Heinrich Hassler, Wendelstein, and Horst Schreiner, Nurnberg, both of, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 22, 1969, Ser. No. 859,795
Claims priority, application Germany, Sept. 20, 1968, P 17 89 005.0
Int. Cl. B29c 6/02; H01l 9/04
U.S. Cl. 174—52 PE 8 Claims



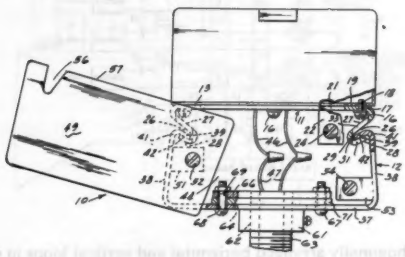
In an encapsulated semiconductor device having a semiconductor body and means for contacting and encapsulating the body, these means comprise a structure of porous sinter metal and of synthetic plastic forming an impregnation in the pores of the sinter metal. An insulating structure of filler-containing plastic is pressure molded onto the sinter metal structure and merges with the impregnation in the pores. Preferably the structure made of filler-containing plastic forms part of the encapsulation.

3,598,897

CONDUIT FITTING FOR PENDENT LIGHT FIXTURES

William Castic, Elkgrove Village, Ill., assignor to The Pyle-National Company, Chicago, Ill.

Filed Aug. 14, 1969, Ser. No. 850,095
Int. Cl. H02b 1/08
U.S. Cl. 174—61 17 Claims



A conduit fitting for attaching pendent light fixtures to an overhead conduit line comprises first and second members respectively attachable to the conduit line and the fixture, wherein the members have complemental mating tongue and groove portions enabling convenient sliding assembly of the members for positively securing the fixtures to the conduit line. Removable cover members selectively close open ends of the grooves to restrain relative movement between the members and provide selective access to a wiring compartment formed between the members for permitting inspection of electrical wiring connections.

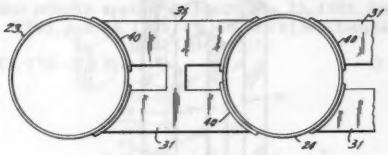
3,598,898

REINFORCED INTERPHASE SUPPORT ARRANGEMENT FOR ISOLATED PHASE BUS SYSTEM

Joseph A. Turgeon, Toronto, Ontario, Canada, assignor to I-T-E Circuit Breaker (Canada) Limited, Port Credit, Ontario, Canada

Filed Apr. 14, 1970, Ser. No. 28,389
Int. Cl. H02g 3/00
U.S. Cl. 174—99 B 4 Claims

An interphase support bracket arrangement for an isolated phase bus system in which a stiffener member is secured in conforming relation to the configuration of the individual bus housings and is provided with a recess to receive an interphase tie. By securing the tie to the stiffener member and



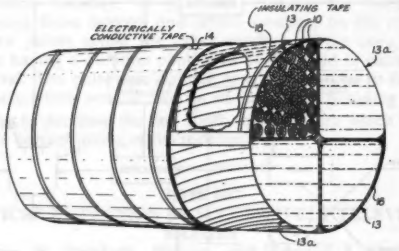
by employing a stiffener of thickness comparable to that of the bus housings, previously encountered difficulties in effectively securing the relatively thick tie to the relatively thin housing are eliminated.

3,598,899

CONDUCTOR FOR UNDERGROUND TRANSMISSION OF ELECTRIC POWER

Carlos Katz, Bayonne, N.J., assignor to General Cable Corporation, New York, N.Y.

Filed Jan. 23, 1970, Ser. No. 5,238
Int. Cl. H01b 7/00
U.S. Cl. 174—119 8 Claims



A conductor adapted for underground transmission of alternating current consisting of a plurality of separate strands includes strands of copper clad with aluminum, the aluminum being about 10 percent to 20 percent of the cross-sectional area of the conductor. The conductor may be made up of aluminum-clad copper strands intermingled with all-copper strands, or strands of copper having oil-impervious coating, the strands being arranged so that the surface of each copper, or coated copper strand, is only in contact with the surface of an aluminum-clad strand. The strands are preferably grouped in segments and helically wound in each segment.

3,598,900

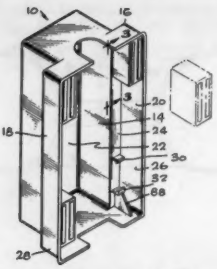
COVER HOUSING FOR TELEPHONE CONNECTORS OR THE LIKE WITH MAGNETIC OR MECHANICAL RETAINING MEANS

King B. Drake, Los Angeles, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Filed June 17, 1969, Ser. No. 834,111
Int. Cl. H02g 3/02; H05k 5/03
U.S. Cl. 174—138 F 20 Claims

The housing comprises a hollow, rectangular structure having one open side, and means to retain the structure in position. The housing is of sufficient size to engage over and enclose a standard, multiple-contact telephone connector. The housing means includes retaining magnets for holding the

housing against a steel surface. The retaining means also includes a wallplate having resilient snapfingers thereon, with



engagement means in the housing for engaging upon the snapfingers.

3,598,901

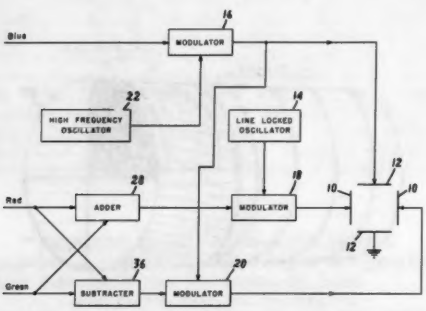
OPTICAL GRATINGS RECORDING SYSTEM

William E. Glenn, Jr., Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,653

Int. Cl. H04n *9/12, 5/82*

U.S. Cl. 178—5.4 BD **20 Claims**



A recording medium is scanned by an electron beam. As the beam scans the medium its motion is modulated to produce a series of high-intensity dots along the lines of the scan. The beam is caused to oscillate to produce an optical grating pattern of variable orientation and intensity by smearing the dots. A second optical grating pattern of fixed orientation can be recorded simultaneously. This system can be used to record color images. The grating of fixed orientation represents one primary color and the grating of variable orientation represents the remaining two primary colors.

3,598,902

GATED DIFFERENTIAL GAIN CONTROL CIRCUIT FOR A TELEVISION RECEIVER

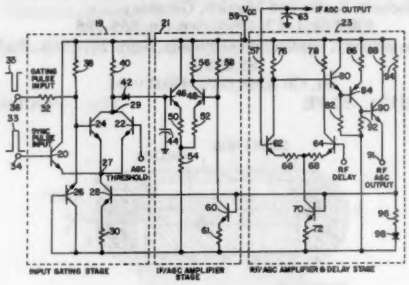
Walter R. Davis, Tempe; Gerald K. Lunn, Scottsdale, and James E. Solomon, Phoenix, all of, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed June 11, 1969, Ser. No. 832,137

Int. Cl. H04n *5/52*

U.S. Cl. 178—7.3 DC **7 Claims**

A monolithic integrated automatic gain control system for a TV receiver includes a differential gating stage having one reference input, a gating pulse input and a synchronizing signal pulse input. This gating stage is responsive to simultaneous application of gating and sync pulses to provide an output signal proportional to the signal level of the video sync pulse. This output signal is supplied to a differential IF-AGC amplifier stage which supplies an amplified IF-AGC output signal to the IF amplifier of a TV receiver to control the gain thereof. A differential RF-AGC amplifier and delay stage is coupled to the IF-AGC amplifier stage output and



provides a delayed RF-AGC signal which is supplied to the RF-amplifier of the TV receiver to provide a delayed RF gain control signal thereto.

3,598,903

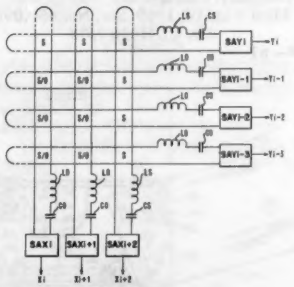
POSITION-IDENTIFYING DEVICE

Robert A. Johnson, and Ray N. Steckenrider, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 6, 1968, Ser. No. 735,019

Int. Cl. G08c *21/00*

U.S. Cl. 178—18 **5 Claims**



Orthogonally arranged horizontal and vertical loops in substantially the same plane are subjected to a narrow RF field radiating from a probe position within the loops at their intersections. Horizontal and vertical sense amplifiers connected to the horizontal and vertical loops respectively respond to the induced current in the loops and provide a detectable output at those amplifiers connected to the intersecting loops within which the probe is located for identifying the probe position.

3,598,904

METHOD AND DEVICE FOR CHANGING A SIMULTANEOUS TELEVISION SIGNAL TO A LINE SEQUENTIAL SIGNAL AND VICE VERSA

Gerhard Foerster, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1968, Ser. No. 745,544

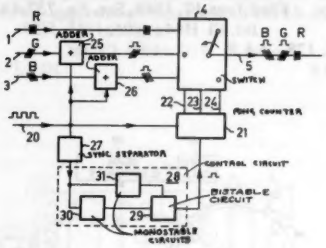
Claims priority, application Austria, July 20, 1967, 6749/67

Int. Cl. H04n *9/42*

U.S. Cl. 178—5.2 R **20 Claims**

In a system for converting simultaneous television signals to line sequential signals, and for reconverting the line sequential signals back to simultaneous signals, the conversion and reconversion are accomplished by means of synchronous switches. In order to synchronize the switches, less than the total number of signals are produced with line-

synchronizing pulses, and the synchronous switches are controlled by ring counters stepped by line-synchronizing pulses.



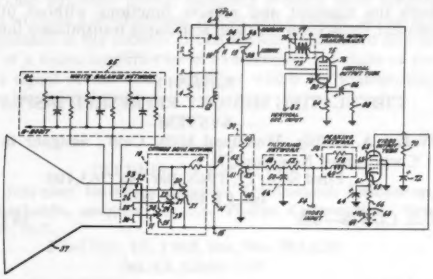
The counters are reset to fixed positions in response to field-synchronizing pulses.

3,598,905

WHITE-BALANCE SERVICING CIRCUIT

Buran I. Keprta, Jr., Norristown, and Sylvester Walczak, Jr., Warminster, both of, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Feb. 25, 1970, Ser. No. 14,090
Int. Cl. H04n *9/20*
U.S. Cl. 178—5.4 TE **11 Claims**



A switching circuit for alternatively conditioning a color television receiver to display images on the screen of its picture tube or to permit accurate adjustment of biases controlling the white balance of the image displayed by the picture tube.

The circuit comprises a double-pole single-throw switch so interconnected with sources of operating voltages for the vertical deflection output tube, the video output tube, and the picture tube, that, when the switch is thrown to its "service" position, i.e. is opened, the receiver is conditioned simultaneously in three ways: (1) plate voltage is removed from the vertical deflection output tube of the receiver, thereby cutting off that tube and preventing vertical deflection of the cathode-ray beams on the picture tube; (2) a bias voltage sufficient to cut off the video output tube is applied to a grid thereof, thereby blocking transmission of the video signal to the picture tube; and (3) a reference black level bias voltage is applied to each of the three kinescope cathodes. When the receiver is so conditioned, the white balance of the image displayed by the picture tube can be accurately set by adjusting the biases supplied to the screen grids of the picture tube.

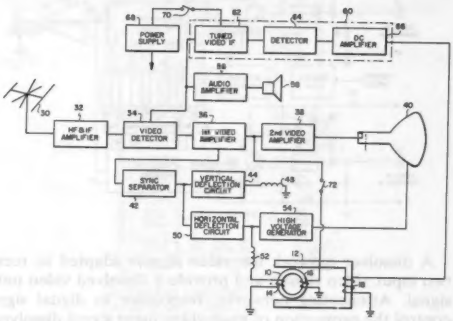
When the double-pole single-throw switch is thrown to its "operate" position, i.e. is closed, normal operating voltages are restored to the receiver, thereby enabling it to reproduce color television pictures.

3,598,906

FINE TUNING INDICATOR

Katsuhito Uetake; Seishiro Iwamura, and Yoshihisa Nishitani, all of Otokuni-gun, Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1969, Ser. No. 792,095
Claims priority, application Japan, Jan. 23, 1968, Jan. 24, 1968, Jan. 24, 1968, 43/3867;43/4134;43/4654
Int. Cl. H04n *5/50*
U.S. Cl. 178—5.8 R **2 Claims**



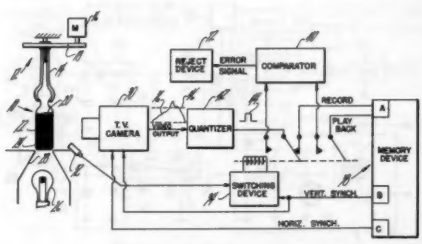
A saturable magnetic core is disposed in a magnetic field whose strength becomes maximum for correct tuning of a television receiver. A sawtooth current for horizontal scanning flows through one of two windings on the core to induce pulses across the other winding on the core, each pulse having a duration controlled by the field in each scan interval. The pulses are applied to a picture tube to form a variable width vertical line on its faceplate. A tuning knob rotates to decrease the line width to about zero which to indicate correct tuning of the receiver.

3,598,907

ARTICLE INSPECTION BY SUCCESSIVELY TELEVISED IMAGES

William H. Drinkuth, Hebron, and Edward J. Stephens, Manchester, both of, Conn., assignors to Emhart Corporation, Bloomfield, Conn.

Filed May 20, 1968, Ser. No. 730,377
Int. Cl. H04n *7/00, 7/18*
U.S. Cl. 178—6 **15 Claims**

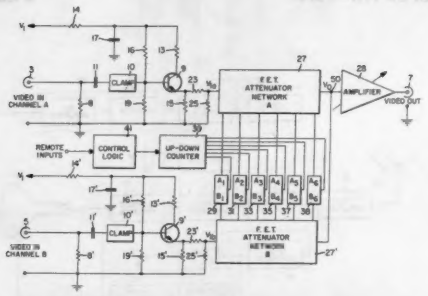


A liquid-filled transparent container is spun momentarily to cause the liquid therein to swirl, and successive video frames provide voltage analogs through a television camera. A memory device is synchronized with the camera and stores at least one of the voltage analogs so that a comparator can subtract one successive analog signal from another to generate an error signal if foreign particles are present in the swirling liquid.

3,598,908
DIGITALLY CONTROLLED LAP DISSOLVER

Anthony Poulett, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 30, 1968, Ser. No. 756,533
Int. Cl. H04n 5/22
U.S. Cl. 178—6 23 Claims

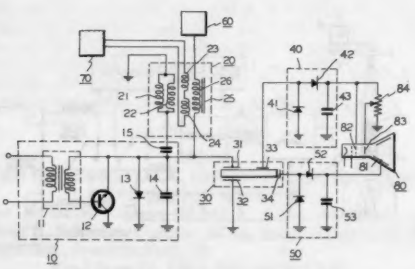


A dissolver network for video signals adapted to receive two input video signals and provide a dissolved video output signal. Attenuating networks, responsive to digital signals, control the proportion of each video input signal dissolved at various steps in the dissolve. The attenuator networks are controlled by an up-down binary counter to correspondingly increase the signal level of one input while reducing the signal level of the other as the counter counts up; and as the counter counts down, decrease the signal level of said one input signal while correspondingly increasing the level of said other signal. The counter may be clocked responsive to the vertical sync reference of the video signals.

3,598,909
A HIGH-VOLTAGE GENERATOR CIRCUIT CONFIGURATION UTILIZING A CERAMIC TRANSFORMER

Reiichi Sasaki, and Teruo Kitani, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed July 25, 1968, Ser. No. 747,563
Claims priority, application Japan, July 25, 1967, Aug. 21, 1967, Aug. 22, 1967, Sept. 21, 1967, 42-48274; 42-54166; 42-54352; 42-80763
Int. Cl. H01v 7/00; H03f 13/00; H04n 5/44
U.S. Cl. 178—7.3 R 1 Claim

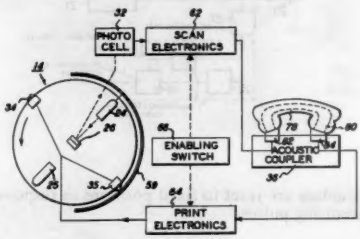


A high-voltage generator circuit configuration. A ceramic transformer which generates a high voltage and has plural resonant modes is connected to a horizontal deflection circuit which generates a pulse voltage containing harmonic components so as to drive said ceramic transformer in its resonant modes. A choke coil is wound on a deflection yoke and acts as a path for DC current so as to supply power to said horizontal deflection circuit.

3,598,910
SELF-TEST APPARATUS FOR FACSIMILE GRAPHIC COMMUNICATION SYSTEM

Armand M. Johnston, Webster; Marion G. Wood, Rochester, and James D. Lehner, Rochester, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 17, 1968, Ser. No. 737,441
Int. Cl. H04n 1/06, 1/32, 5/58
U.S. Cl. 178—6.6 R 15 Claims

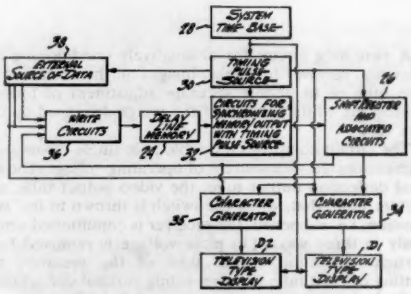


A facsimile graphic communication system wherein an operator may test the transmitting and receiving functions of a transceiver by utilizing only the equipment associated with the transceiver. A self-test feature is provided whereby a transceiver unit is enabled to transmit to itself for testing the transmitting and receiving functions. A special test document is provided where the transceiver scans part of the document and prints on another part of the document, thereby testing both the transmit and receive functions without utilizing another transceiver unit and associated transmission line.

3,598,911
CIRCULATING MEMORY-REFRESHED DISPLAY SYSTEM

Walter A. Helbig, Woodland Hills, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 27, 1968, Ser. No. 763,105
Int. Cl. H04n 5/76
U.S. Cl. 178—6.8 16 Claims

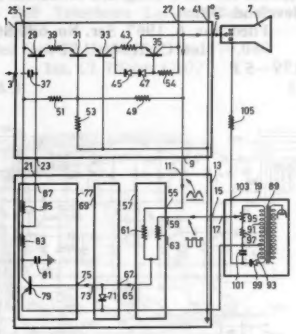


Delay-line-refreshed video display system. The display, a television receiver, is locked to a stable clock frequency source, however, the information from which the video signals are derived arrive from the delay line memory at times which are not necessarily synchronous with this frequency. Means, including logic circuits and temporary storage circuits, derive from this asynchronous data the synchronous information required by the television display.

3,598,912
VIDEO AMPLIFIER WITH BLACK LEVEL CONTROL

Antonius Hendrikus Hubertus Jozef Nillesen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,555
Claims priority, application Netherlands, Feb. 13, 1969, 6902317
Int. Cl. H04n 5/16
U.S. Cl. 178—7.3 DC 6 Claims

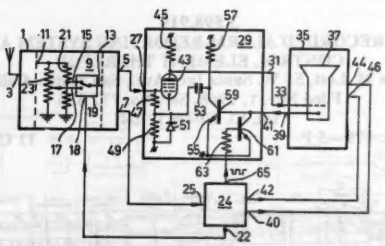


A video amplifier circuit including a black level control circuit wherein a level-shifting circuit and a limiter circuit are incorporated in the control circuit between an output and an input of a video amplifier so as to eliminate the parts of the output signal of the video amplifier which are unimportant for the black level control.

3,598,913
TELEVISION RECEIVER

Peter Johannes Hubertus Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,629
Int. Cl. H04n 5/16
U.S. Cl. 178—7.5 DC 4 Claims

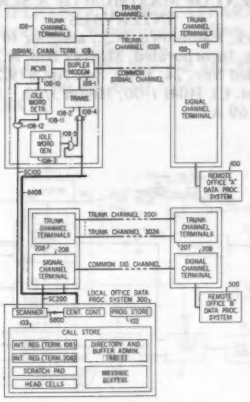


This invention relates to a control circuit for a television receiver which features a gated circuit which passes the flyback signal a different selected amount than the video intensity signal. Therefore, the ratio of the flyback signal to that of intensity signal is controllable. The flyback signal is used to control the beam current intensity by use of a rectifier circuit.

3,598,914
TERMINAL FOR COMMON CHANNEL SIGNALING SYSTEM

Judson B. Synnott, III, Downers Grove, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1969, Ser. No. 878,753
Int. Cl. H04l 7/08
U.S. Cl. 178—58 7 Claims

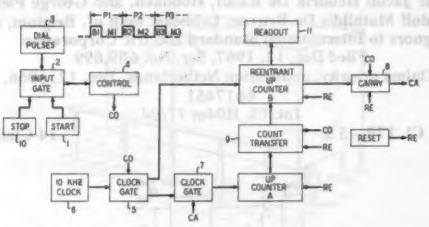


A common channel signaling system has a duplex signaling channel equipped with terminals that are adapted to maintain a constant data rate by inserting idle words when there are no data words to be transmitted and by inserting an additional synchronizing word when the error control information obtained by analyzing a block of data from a remote terminal is not completed within a predetermined interval before the arrival of the word position which is normally intended to contain such error control information.

3,598,915
MEASUREMENT OF MAXIMUM OF A SERIES OF TIME INTERVALS

Henry Mann, Holmdel, N.J., and Joseph A. Whiteaker, Rock Hill, S.C., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

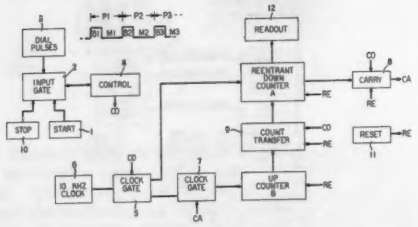
Filed Nov. 24, 1969, Ser. No. 879,262
Int. Cl. H04l 1/00; H04m 3/22, 1/24
U.S. Cl. 178—69 A 13 Claims



The circuit uses digital technique to measure the maximum break (or make) interval over a series of telehpone dial pulses. During the first break, clock pulses are serially counted in a binary coded decimal up-counter A. At the end of the first break, the nine's complement of the A count is transferred into a binary coded decimal reentrant up-counter B of the same count capacity as A; and, the old (first) count is retained in A. During the second (new) break, clock pulses are serially added (complementary addition equals subtraction of old count from new count) to the cont in B. Any clock pulses exceeding the capacity of B (in going from

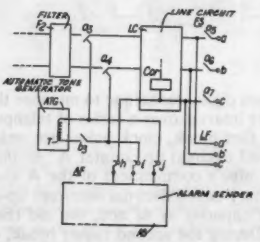
capacity count to zero count) are serially added to the old count in A. At the end of each new measured break, A contains the maximum of the old and new counts, the nine's complement of the maximum is transferred to B, and the process repeats. Visual display is provided of the maximum count by translation from clock pulse count in B to milliseconds.

3,598,916
MEASUREMENT OF MAXIMUM OF A SERIES OF TIME INTERVALS
Robert B. Heick, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 24, 1969, Ser. No. 879,284
Int. Cl. H04l *1/00*; H04m *3/22*, *1/24*
U.S. Cl. 178—69 A **11 Claims**



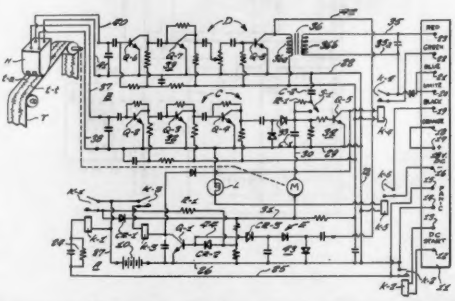
The circuit uses digital technique to measure the maximum break (or make) interval over a series of telephone dial pulses. During the first break, clock pulses are serially counted in a binary coded decimal up-counter. At the end of the first break, the up-count is transferred as a starting count to a binary coded reentrant down-counter of the same count capacity as the up-counter; and, the old (first) count is retained in the up-counter. During the second (new) break, clock pulses are serially subtracted from the count in the down-counter. Any clock pulses exceeding the number required to cause the count in the down-counter to go from zero count to capacity count are serially added to the old count in the up-counter. At the end of each new measured break, the up-counter contains the maximum of the old and new counts, the maximum count is transferred to the down-counter as a new starting count, the maximum count is retained in the up-counter, and the process repeats. Visual display is provided of the maximum count by translation from clock pulse count in the down-counter to milliseconds.

3,598,917
AUTOMATIC SIGNAL TRANSMISSION SYSTEM
Egide Jacob Hendrik De Raedt, Hoboken, and George Pieter Adolf Mathildis De Bruyne, Lebbeke, both of, Belgium, assignors to International Standard Electric Corporation
Filed Dec. 12, 1967, Ser. No. 689,899
Claims priority, application Netherlands, Dec. 12, 1966, 6617451
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **14 Claims**



An alarm system is provided to operate over the existing public telephone network. An AC oscillator at each substation provides a continuous signal which is separated in frequency and by filter from any voice signals. Disconnection of the continuous signal will supply an alarm and cause equipment in the central office to connect to an operator, a police station or a fire station. Suitable central office equipment can identify the source of the alarm signal and provide an indication to the called station.

3,598,918
ELECTRONIC-SIGNALING DEVICE FOR INTERCONNECTION WITH TELEPHONE SYSTEM INTERFACING DEVICES
Alfred G. Dee, Elmont, L.I., and Jos Van Marrewyk, Valley Stream, both of, N.Y., assignors to Eaton Yale & Towne, Inc., Cleveland, Ohio
Filed Nov. 6, 1967, Ser. No. 680,862
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **6 Claims**



An electronic-signaling device for transmitting messages over an automatically seized telephone line to predetermined recipients such as police stations, fire stations, central security offices and the like. The device includes an endless magnetic tape having two signal tracks prerecorded therein, one of tone signals providing for seizure of the telephone line and simulated telephone number dialing without the lifting of a receiver off the hook, and the other of audio signals providing a series of messages stating the nature of the emergency. A tone stop signal incorporated in the message track serves to deactivate the device upon completion of the transmission. A key-operated switch is provided to permit the device to be conditioned so as to prevent inadvertent dialing, and activation of the device may be effected through closing of the supervisory circuit either by a manually operated panic button or by application of an emergency-generated starting potential to a suitable relay.

3,598,919
PRE-RECORDED ALARM-REPORTING SYSTEM AND CONTROL ELEMENT THEREFOR
Thomas M. Lott, 55 W. Santa Inez Ave., San Mateo, Calif.
Filed Nov. 1, 1968, Ser. No. 772,536
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P **11 Claims**

In response to an alarm detector element a tape player coupled to a conventional telephone line generates pulses which serve to call an appropriate authority and provide a prerecorded audible alarm report message followed by request that the authority confirm the authenticity of the report by returning the call within a predetermined period thereafter. If the called authority returns the call within the

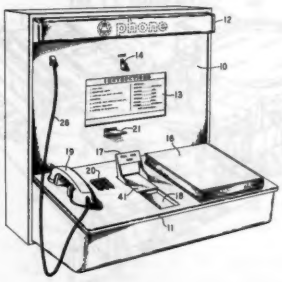
predetermined period, the tape player then calls additional parties and makes appropriate reports to such parties. By returning the call, controls are activated which serve to inhibit the repetitious further repeat calling of the same alarm report call. Ultimately, in the event that no called party calls back to verify receipt of a call from the tape player, a signal is generated which activates a local audible alarm proximate to the premises being protected.

3,598,920

COIN TELEPHONE FACILITY FOR COMBINED USE BY GENERAL PUBLIC AND PHYSICALLY HANDICAPPED

James L. Fischer, Corinth, Miss.; Carroll D. Hays, Brownsburg, Ind., and Richard G. Klier, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1969, Ser. No. 870,040
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.3 **11 Claims**



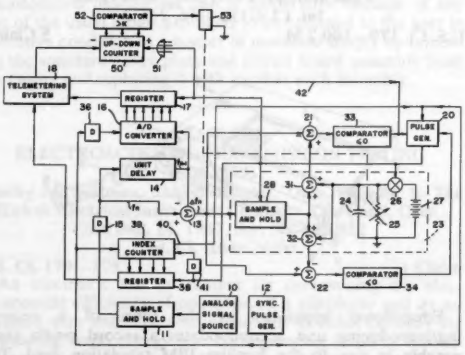
In a coin telephone facility designed for use by both physically handicapped persons and the general public, a vertical wall mounted portion supports a forwardly sloping shelf portion. For easy access, the telephone handset, the pushbutton dial and an oversized coin return lever are mounted on the shelf portion. A mechanism below the shelf operated by the coin return lever raises refunded coins and delivers them into a shelf-level receptacle.

3,598,921

METHOD AND APPARATUS FOR DATA COMPRESSION BY A DECREASING SLOPE THRESHOLD TEST

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Leonard Kleinrock, Los Angeles, Calif.

Filed Apr. 4, 1969, Ser. No. 813,494
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 R **12 Claims**



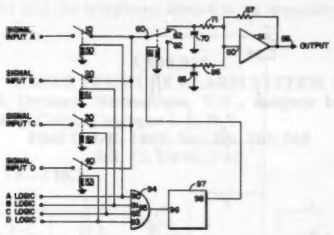
A method and apparatus is disclosed for data compression by a decreasing slope threshold test in which the data stream is examined and only those samples are selected for transmission which have a slope (first difference or first derivative) that exceeds an exponentially decreasing range established by a decreasing voltage added to and subtracted from a slope measurement at the time the last sample was transmitted. The time between successive transmissions is also transmitted in order that the reconstructed function may be formed by linear interpolation of the transmitted samples.

3,598,922

MULTIPLEXER CONTROL APPARATUS

Frank W. Ainsworth, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 2, 1967, Ser. No. 657,856
Int. Cl. H04j *3/04*
U.S. Cl. 179—15A **7 Claims**



A multiplex fader apparatus for switching between various control system input signals without producing unwanted transients at the output of the system.

ERRATUM

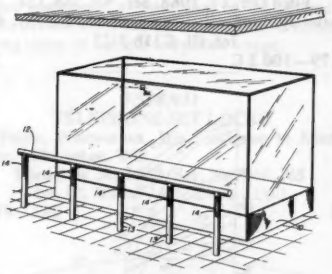
For Class 179—18 see:
Patent No. 3,599,235

3,598,923

TRANSMITTING ANTENNA SYSTEM FOR AUDIO INDUCTION COMMUNICATION SYSTEM

Justin L. Turner, Branford, Conn., assignor to Educational Service Programs, Inc., New Haven, Conn.

Filed Apr. 21, 1969, Ser. No. 817,812
Int. Cl. H04b *5/00*
U.S. Cl. 179—82 **16 Claims**



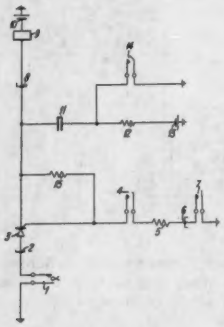
A transmitting antenna system for an audio induction communication system provides an active message field within a three-dimensional pickup zone consisting of a magnetic field which varies in frequency directly in accordance with the frequency of the transmitted message. The system comprises a plurality of antennas, each consisting of an elongated core of magnetic material and a winding on the core, located beyond the pickup zone and arranged and energized so that the magnetic field of each antenna within the pickup zone has only one generally vertical direction and so that such one

generally vertical direction at any given instant is the same for all of the fields of all of the antennas of said system. By varying the number, the arrangement, the energization and the construction of the individual antennas the shape and size of the pickup zone may be precisely controlled to allow two or more pickup zones to be placed close to one another without mutual interference.

3,598,924
LINE HOLDING CIRCUIT FOR A MULTILINE TELEPHONE SYSTEM

Daniel Zucker, Rishon Lezion, Israel, assignor to Telrad Telecommunication & Electronic Industries Limited, Lod, Israel

Filed May 1, 1969, Ser. No. 820,994
Claims priority, application Israel, May 24, 1968, 30,070
Int. Cl. H04m *1/00*
U.S. Cl. 179—99 **1 Claim**



The invention relates to a line holder circuit for a multiline telephone system which allows for the line to be held when the user, by actuating the line extension contacts, wishes to establish communication with an associated extension.

3,598,925
MAGNETIC HEAD WITH TAPE-CONTACTING GUARD SURFACE AND POLE TIPS OF SIMILAR IRON-BASED MATERIALS

Yoshio Sakai, Yokohama-shi, Kanagawa-ken; Zenkichi Nakamura, Miyagi-gun, Miyagi-ken; Katsumasa Takahashi, Tokyo, and Naotoshi Sasada, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

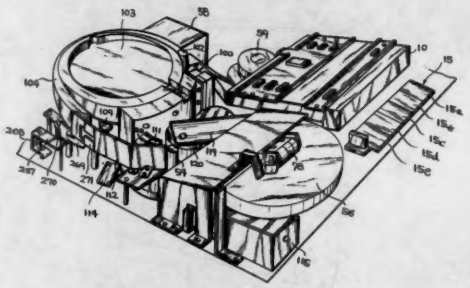
Filed Oct. 17, 1968, Ser. No. 768,324
Claims priority, application Japan, Oct. 18, 1967, 42/67040
Int. Cl. G11b *5/22*
U.S. Cl. 179—100.2 C **11 Claims**

A magnetic head for video tape recorders having adjacent its iron-silicon-aluminum alloy pole tips a guard member of an iron-silicon-aluminum alloy providing a tape contact surface having a hardness substantially equal to or a little less than that of the pole tips over the operating temperature range, but which guard material is substantially nonmagnetic under working conditions. It is preferred to have the constituent elements of the material of the guard member similar to those of the pole tip material. The guard member may also be of a nonmagnetic iron-aluminum-molybdenum alloy with pole tips of an iron-silicon-aluminum alloy for example.

3,598,926
MAGNETIC RECORDING AND REPRODUCING APPARATUS OF THE AUTOMATIC TAPE THREADING SYSTEM

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Yokohama, Japan

Filed Jan. 23, 1969, Ser. No. 793,462
Claims priority, application Japan, Jan. 25, 1968, May 15, 1968, Apr. 12, 1968, 43/4,448; 43/39,287; 43/23,984
Int. Cl. G11b *15/32*
U.S. Cl. 179—100.2 T **7 Claims**

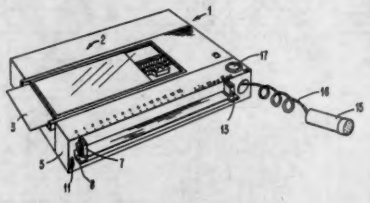


A magnetic tape recording and reproducing apparatus includes an automatic tape threading system comprising a supply reel of magnetic tape. A normally straight and flexible tape leader portion is connected to the leading end of the magnetic tape. A delivery roller unwinds the magnetic tape from the supply reel and guides the tape leader portion to preclude contact between the leader and a magnetic head. The tape itself is deflected from the path followed by travel of the tape leader portion and is brought into contact with the magnetic head. A takeup reel automatically catches the tape leader portion and loads the apparatus with the magnetic tape.

3,598,927
EDUCATIONAL APPARATUS WITH PROGRAMMING FACILITIES

Frank E. Becker, and Walter F. Klein, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,322
Int. Cl. G11b *5/56, 21/12*
U.S. Cl. 179—100.2 M **5 Claims**



Educational apparatus in the form of a recording/reproducing unit accommodates a record media comparable in size to the familiar IBM tabulation card. The media has printed information on one side such as questions and answers, circuit diagrams, etc. that are visible to the user when in operating position and recorded information on the

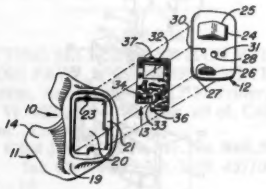
opposite side positioned for scanning by a transducer during playback and record modes. Preferably, the media has either the visible information or the magnetically stored information, or both, divided into blocks of convenient size representing different questions, multiple choice answers, or the like, with the recorded information and the visible information correlated with one another. Programming structures are provided in the apparatus enabling the user to roughly scan toward a selected block of information on the media but defining a plurality of program stops arranged adjacent the beginning of each of the blocks of information and facilitating the positioning of the transducer with respect to the first track in a selected block.

3,598,928

IN EAR HEARING AID WITH REMOVABLE MOUNTING PLATE ASSEMBLY

George B. Hickox, Concord, Calif., assignor to Phonic Electronics, Inc., Concord, Calif.

Filed Nov. 6, 1969, Ser. No. 874,501
Int. Cl. H04r *25/02*
U.S. Cl. 179—107 E **7 Claims**



A customized hearing aid configurated in part to conform actuarately to the contours of the ear canal of a person using the aid, and adapted to be contained entirely within his ear. The hearing aid includes a hollow casing having a customized body portion molded to conform to the users ear and provided along one side with a face having a standardized opening therein, it further includes a mounting plate assembly comprising a cover plate and a circuit board secured thereto and standardized to seat within such opening in the face of the casing, and it also includes contact retainers carried by the mounting plate assembly and respectively cooperative with terminals attached to the casing to releasably secure the assembly thereto in a mechanical sense and, at the same time, electrically connect a speaker element mounted within the casing to the amplifier and microphone elements carried by the faceplate and circuit board assembly, thereby enabling a customized hearing aid that is inoperative because of any one of the usual repair problems to be returned to the user in operative condition in a matter of moments simply by removing the standard cover plate and circuit board assembly from the casing and replacing it with another such assembly.

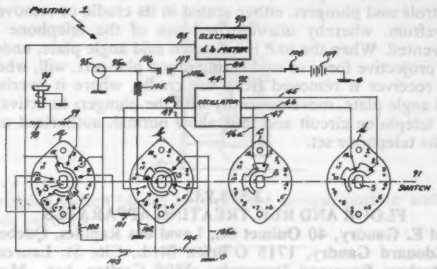
3,598,929

ELECTROACOUSTIC TRANSMISSION TESTING DEVICE

Stanley M. Seidman, Shaker Heights, Ohio, assignor to The Hickok Electrical Instrument Company, Cleveland, Ohio

Filed Dec. 14, 1967, Ser. No. 690,522
Int. Cl. H04r *29/00*
U.S. Cl. 179—175 **1 Claim**

An electronic test instrument for determining the electroacoustic efficiency of operation of a telephone and its associated wire line. The test instrument includes circuitry for translating audio energy into corresponding levels of electrical energy and electrical metering equipment to visually indicate the said levels of energy. The test instrument is capable of measuring the transmitting and receiving efficiency of operation of the telephone and connected wire line which in the art is also known as a loop-and-station and enables the energy losses in the four main component parts of the loop-



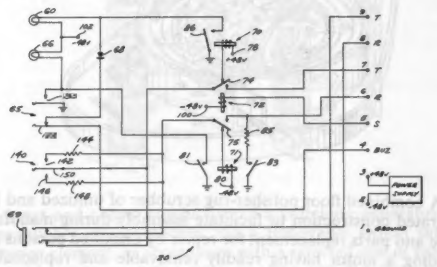
and-station, i.e., the loop, telephone receiver, telephone transmitter and the telephone circuit to be measured.

3,598,930

CABLE PRESSURE ALARM SYSTEM

Arnold B. Desnoes, Massapequa, N.Y., assignor to Puregas Equipment Corp., Copiague L.I., N.Y.

Filed Oct. 8, 1968, Ser. No. 765,765
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 **4 Claims**



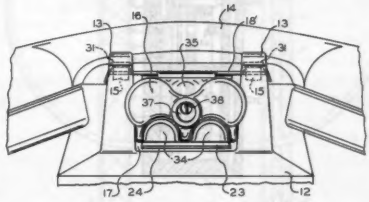
A line alarm system for the dual use of a telephone subscriber's cable pair which is capable of functioning at all times, other than periods of regular telephone service, as an alarm-monitoring circuit for indication of remote faults. A contactor and a high value series resistance which, upon operation shunts the telephone unit. A relay sensitive to the operation of the contactor and the consequent small current flow to provide an alarm, a second relay responsive to a subscriber initiated telephone call and a larger current flow, and a third relay responsive to operation of the second relay as well as a subscriber directed telephone call to eliminate said alarm during times of normal telephone usage.

3,598,931

TELEPHONE SET LOCKS

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed July 30, 1969, Ser. No. 846,145
Int. Cl. H04m *1/66;* **E05b** *13/00*
U.S. Cl. 179—189 **8 Claims**



A lock unit secured within a base cavity in a cradle telephone includes a reciprocal angle plate susceptible of

being releasably locked in a lowered position wherein its top portion spans the circuit controlling yieldable plungers to hold the same depressed with the receiver, which normally controls said plungers, either seated in its cradle or removed therefrom, whereby unauthorized use of the telephone is prevented. When the unit is unlocked said angle plate, under the projective force of said spring urged plungers, will, when the receiver is removed from the cradle, where it overlies said angle plate, move upwardly with the plungers to activate the telephone circuit and thus allow normal, authorized use of the telephone set.

3,598,932

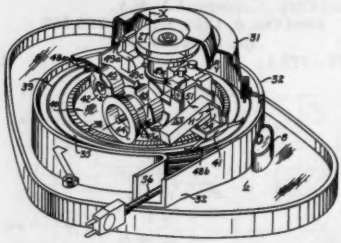
FLOOR AND RUG TREATING APPARATUS

Paul E. Gaudry, 40 Ouimet St., Laval des Rapides, Quebec; Edouard Gaudry, 1715 O'Brien Blvd., Cite St. Laurent, Quebec; Raymond Descarries, 3809 Carlton Ave., Montreal, Quebec, and James Anderson, 48 Lombardy Road, Baied Durfe, Quebec, all of, Canada

Filed May 26, 1969, Ser. No. 827,760

Int. Cl. B65h *75/48*

U.S. Cl. 191—12.2 **3 Claims**



A combined floor polisher-rug scrubber of unitized and integrated construction to facilitate assembly during manufacture and parts replacement for repair by unskilled persons including a motor having readily removable and replaceably stator and rotor ball bearings and brush block assembly; electric circuit components which automatically couple the motor and cordwinder cord during manufacturing assembly and disassembly and replacement for repair; and including a weighted switch to prevent accidental operation of the machine when an operator is changing the cleaning brushes.

3,598,933

ELECTRICAL MULTIPOSITIONAL SWITCH ARRANGEMENT

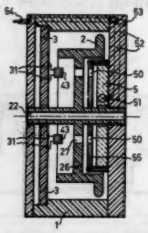
Jurg Walser, Griefensee, Switzerland, assignor to Contraves AG, Zurick, Switzerland

Filed June 24, 1969, Ser. No. 836,097

Claims priority, application Switzerland, Dec. 6, 1968, 18266/68

Int. Cl. H01h *19/58*

U.S. Cl. 200—11 **15 Claims**



An electrical multipositional switch arrangement is disclosed having a rotatable switching wheel and at least one stationary circuit board or plate possessing contact tracks for the purpose of generating switching signals in accordance with a predetermined code as a function of the position of the switching wheel. The switch arrangement includes connection elements mounted between corresponding contact tracks, these connection elements being actuated according to the predetermined code in dependency upon the position of the switching wheel by switching means which do not come in contact with the connection elements.

3,598,934

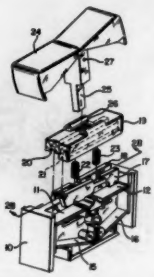
MULTIPLE POLE SWITCH FOR PRODUCING SIMULTANEOUS OPPOSITE SWITCHING OPERATIONS

William H. O'Connor, III, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed July 7, 1969, Ser. No. 839,447

Int. Cl. H01h *15/00*

U.S. Cl. 200—16 R **10 Claims**



A multiple pole electric switch of the type wherein different poles are respectively connected and disconnected by a single movement of the switch which includes a plurality of stationary contacts, a pluraLity of movable contacts preferably positioned to bridge a gap between a pair of the stationary contacts, and insulating projection means intermediate the pair of stationary contacts. Each movable contact includes a recess which engages the projection and an extending portion which engages one of the stationary contacts in the closed position. In the open position, the movable contact is moved so that the extending portion is lifted out of engagement with the stationary contact by the projection. At least one of the movable contacts is mounted for opposite movement relative to the remainder of the movable contacts so that the one contact opens when the remainder close and closes when the remainder open. Preferably, the extending portion of the movable contact is engaged by the projection and spaced from the stationary contact for a sufficient proportion of its movement so that, during switch operation in either direction, the initially closed contacts open before the initially opened contacts close.

3,598,935

MULTIPLE POLE ELECTRICAL SWITCH WITH IMPROVED SNAP-ACTION ACTUATOR STRUCTURE

Joseph A. Nava, Villa Park, and John M. Tums, Oak Park, both of, Ill., assignors to The Pyle-National Company, Chicago, Ill.

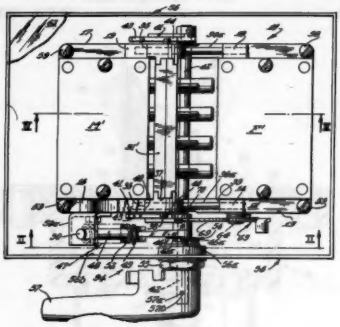
Filed July 31, 1969, Ser. No. 846,431

Int. Cl. H01h *3/00, 15/18, 33/46*

U.S. Cl. 200—17 **10 Claims**

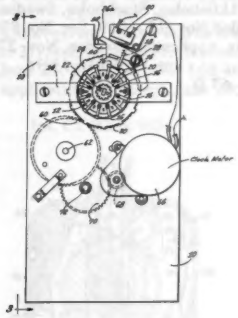
A multiple pole electrical switch comprising plural male and female contacts mounted on a pair of spaced contact-carrying members. The male contacts are jointly removable axially into and out of engagement with the female contacts.

Movement of the male contacts is provided by a toggle mechanism which affords a rapid snap-action. Additional



contact-carrying members can be stacked one above the other to increase the number of poles of the switch.

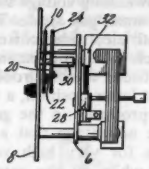
3,598,936
SNAP-ACTING SELECTOR SWITCH WITH DOUBLE ACTING PAWL ESCAPEMENT MECHANISM
Myrl J. Saarem, Arleta; Delbert L. Merriner, Glendale, and Woodrow W. Miller, Los Angeles, all of, Calif., assignors to Richdel, Inc., Los Angeles, Calif.
Filed July 9, 1969, Ser. No. 840,388
Int. Cl. H01h *3/00, 7/08, 43/10*
U.S. Cl. 200—18 **5 Claims**



A snap-acting wafer switch mechanism is provided which has particular utility in selector switch circuitry, and especially in such circuitry which includes inductive means that causes the switch contacts to have a tendency to arc and burn. The snap-acting control of the wafer switch of the invention causes the movable contact to move with a snap action as the switch is turned from one fixed contact to the next so that arcing is minimized, and especially in the inductive type of load circuit.

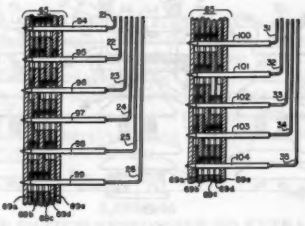
3,598,937
CLOCK TIMER SWITCH
Charles A. Balchunas, Hopkinton, Mass., assignor to General Electric Company
Filed Apr. 13, 1970, Ser. No. 27,737
Int. Cl. H01h *7/08, 43/00*
U.S. Cl. 200—35 R **8 Claims**

A switch and switch-mounting arrangement for a clock timer wherein a switch-mounting block is formed of a single piece of plastic material. The mounting block includes two side portions which are folded toward a central portion for



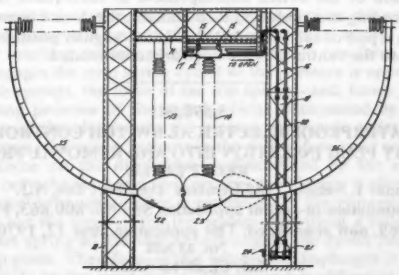
gripping switch blades between the central portion and the side portions.

3,598,938
ADJUSTABLE SWITCHING APPARATUS WITH REMOVABLE SWITCH SETTING ELEMENT
Emil C. Walker, Woodstock, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Division of Ser. No. 514,050, Dec. 15, 1965. Filed Jan. 21, 1969, Ser. No. 792,389
Int. Cl. G06k *7/04*
U.S. Cl. 200—46 **2 Claims**



Input and output conductors of a switching apparatus are permutably interconnected, via a removable switch setting storage element, in accordance with a selected one of several possible interconnection patterns. The switch-setting information is stored in the removable element by means of a plurality of concealed electrically conductive circuit paths insulated from one another. Sensing of the hidden information is made possible by conductive lancing probes or pins, connected to the conductors, that pierce the removable element and engage the conductive paths. The paths thus serve to permutably connect the input conductors to the output conductors.

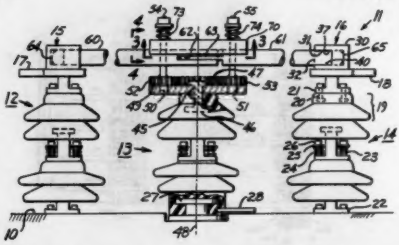
3,598,939
ISOLATING SWITCH FOR ULTRA HIGH VOLTAGES
Gustave E. Heberlein, Bryn Mawr, and James B. Owens, Rosemont, both of, Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.
Filed Mar. 3, 1970, Ser. No. 16,030
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **7 Claims**



An isolating switch having large metallic electrodes presenting substantially smooth surfaces facing one another,

with at least one of the electrodes being movable by means of a moving carriage to which it is secured. The electrodes in the open gap position have a relatively high withstand or insulation strength on switching voltage surge, impulse voltage, and with a relatively small gap space. The movement of the carrier to contact both electrodes corresponds to the closed position of the switch while movement of the carriage to break the contact between the electrodes corresponds to the open position. In that latter position, a substantially uniform electrostatic field is produced in the gap between the electrodes. This has the advantage that a simple and reliable disconnecting means for very high voltage lines and apparatus is provided while, at the same time, significantly reduces the size, weight and land requirements of previous disconnect switches because of the improved electrical gradients made possible by the electrode geometry.

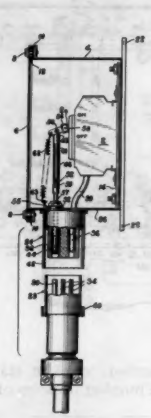
3,598,940
ISOLATOR SWITCH
Anderson B. Smedley, 1191 Morada Place, Altadena, Calif., and Paul A. Smedley, 3780 Canfield Road, Pasadena, Calif.
Filed June 9, 1969, Ser. No. 831,514
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **23 Claims**



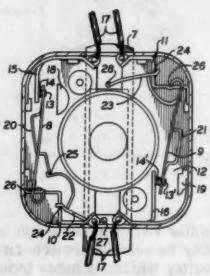
An isolator switch for high voltage transmission lines and switch yards. A switchblade is rotatably mounted to a bearing which bearing is rotatable around a central axis. The switchblade can be swung in a plane normal to the central axis independently around the bearing, and also around the central axis by rotation of the bearing around the central axis. A contact member is spaced from the central axis, and exposes a contact surface to the switchblade. A circuit is completed by the combined motions of turning the switchblade around the bearing and turning the bearing around the central axis, so as to move the switchblade against the contact surface in an abutting relationship which may be either compressive or sliding, there being a substantial longitudinal movement of the tip of the switchblade along the line joining the contact surface and the central axis, this being a toggle-type motion. Preferably the contact surface is inside a cavity whose walls will restrain the tip of the blade from lateral disengagement after the contact is made. The contact member and also the switchblade may be mounted to a column which permits deflection in response to force exerted between them, and which also renders the conductive portion of the switch nonresponsive to earthquake motion. According to a preferred embodiment, the device is provided with a pair of such switchblades whose angular positions relative to the central axis are angularly coordinated.

3,598,941
WATERPROOF ELECTRICAL SWITCH CONTROLLED BY PLUG INSERTION INTO AND REMOVAL FROM RECEPTACLE
Gunnar I. Nelson, 2185 Lemoine Ave., Fort Lee, N.J.
Continuation-in-part of application Ser. No. 800,863, Feb. 20, 1969, now abandoned. This application June 12, 1970, Ser. No. 45,844
Int. Cl. H01h *33/54*
U.S. Cl. 200—51.09 **8 Claims**

A waterproof electrical switch or trip-free, circuit breaker controlled by the presence or absence of an electrical plug in a mating receptacle. During insertion of the plug into the receptacle, one of the plug pins engages and operates mechanism to turn the switch or circuit breaker on. Conversely, withdrawal of the plug from the receptacle turns the switch off or prepares the trip-free, circuit breaker for resetting. The switch preferably control energization of the receptacle. Thus, the receptacle is energized only when the plug has been inserted, and is deenergized in response to removal of the plug or tripping of the circuit breaker.



3,598,942
CONTACT DEVICE FOR ELECTRIC TIMERS OR SIMILAR APPARATUS
Rolf Karl Wilhelm Laven, Täby, Sweden, assignor to Lumalampan Aktiebolag, Stockholm, Sweden
Filed Nov. 25, 1969, Ser. No. 879,790
Claims priority, application Sweden, Nov. 27, 1968, 16191/68
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 D **8 Claims**



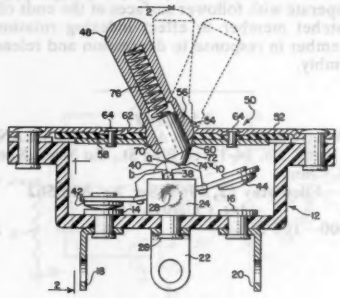
An electrical contact controlled by a timing mechanism in which not one, but two spring-biased contact arms are arranged in cooperating opposing relation. The contact tripping or actuating member of the timer, the part to which timer output movement is imparted in accordance with timing operation of the timer, is operatively connected to the springs of these contact arms so that the spring forces of each spring acting on the timing mechanism tend to cancel each other out and thus do not interfere with timer movement. However, the spring urgency exerted in a direction on the switch contacts is arranged to obtain circuit-completing positions of the contact arms under sufficient pressure which assures firm surface contact of the electrical contacts.

3,598,943

ACTUATOR ASSEMBLY FOR TOGGLE SWITCH

Edward L. Barrett, La Grange Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 1, 1969, Ser. No. 881,049
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G 4 Claims



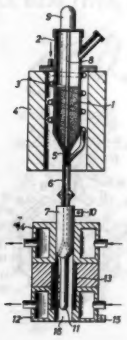
Actuator assembly for snap action toggle switch has a rockerlike actuator member which is pivoted on a transverse axis. A roller mounted on the actuator member is adapted to be engaged for overcenter movement of the actuator at a point spaced from the pivot axis of the actuator member by a member on the end of the toggle lever having a curved outer surface resiliently biased into engagement with the roller. By the use of a pair of curved cooperating surfaces to cause overcenter movement, at least one of which is a roller, which contact each other intermediate their respective pivot mountings, a very unstable teaseproof mounting is provided.

3,598,944

A DEVICE FOR THE HEAT TREATMENT OF POWDERY SUBSTANCES BY MEANS OF A HIGH-TEMPERATURE PLASMA

Peter Weimar, Kolbergerstr. 28A, Karlsruhe, and Harry Liepelt, Bruhlstr. 27, Staffort, both of, Germany

Filed June 27, 1966, Ser. No. 560,469
Claims priority, application Germany, June 28, 1965, G 44 007
Int. Cl. B23k *9/04*
U.S. Cl. 219—76 10 Claims



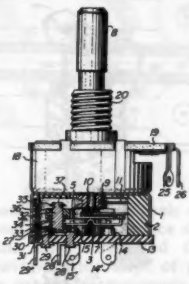
Apparatus for use therein for heat treating irregular shaped particles of nuclear fuels so as to produce granules of substantially spherical shape comprising preheating the irregular nuclear fuel particles to high temperatures, but below the melting point thereof, separate preheating a carrier gas for the particles, admixing the heated particles with the heated gas, introducing the mixture in predetermined amounts into a high temperature plasma zone, heating the particles in said zone to effect the melting of the surfaces of the particles and to thereby produce the spherical granules.

3,598,945

THREE POLE PULL-PUSH SWITCH

Hiroshi Matsui, Neyagawa-shi, and Yozo Suzumura, Higashiosaka-shi, both of, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma-shi, Japan

Filed Aug. 22, 1969, Ser. No. 852,304
Claims priority, application Japan, Feb. 25, 1969, 44/16686
Int. Cl. H01h *15/18*
U.S. Cl. 200—76 1 Claim



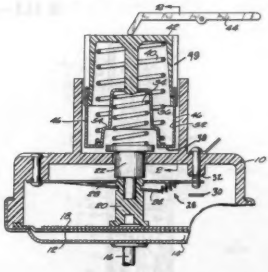
A pull-push switch primarily adapted to be used in interlocking relationship with a variable resistor, wherein there are provided in total three sets of open-close contacts including one additional movable contact provided on the arcuate center portion of a U-shaped movable member of an insulating material which has been used in the conventional double-pole type switches, thereby making it possible to simultaneously open or close three circuits.

3,598,946

PRESSURE SWITCH RESPONSIVE TO EXTRA LOW PRESSURE

Tore B. Hanssen, Roselle, and Erich Kothe, Schiller Park, both of, Ill., assignors to Controls Company of America, Melrose Park, Ill.

Filed Dec. 24, 1969, Ser. No. 887,898
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 WM 11 Claims



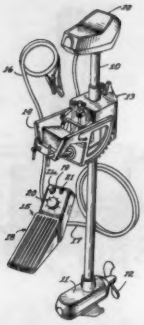
In normal operation, the rising diaphragm raises the actuator and spring seat against the force of the reset spring. Just before reaching the trip point of the switch in one form, the seat engages the strip spring eyelet so the pressure is opposed by both springs, the force of the trip spring—and, hence, the operating pressure of the switch—being determined by the position of the plunger. As the pressure decreases under the diaphragm, the eyelet bottoms in the well before reset so the reset force on the diaphragm is determined by the reset spring only. At extra low level settings the plunger is allowed to rise until the spring lifter is picked up by the plunger—to cancel out the force of the trip spring—and lifted a little by the reset spring so the seat cannot engage the eyelet before the trip point. Therefore, at this setting the diaphragm is opposed only by the reset spring. The second modification differs in that the reset spring is affected by the trip spring adjustment.

3,598,947

PEDAL OPERATED CONTROL FOR ELECTRIC FISHING MOTORS

Ralph C. Osborn, Bloomington, Ill., assignor to Osborn Engineering Corporation

Filed Nov. 3, 1969, Ser. No. 873,187
Int. Cl. H01h 3/14
U.S. Cl. 200—86.5 7 Claims



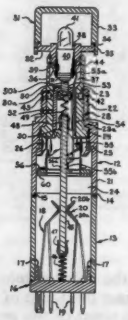
A pedal control for electric outboard fishing motors having a first motor for driving the propeller and a second motor for rotating the propeller support for steering. A single pedal is mounted for selective engagement with an on-off switch for the propeller drive motor and forward and reverse switches for the steering motor and is mounted on a control unit which may be easily carried about a boat for a remote control. The unit includes speed control and directional elements which may be foot-actuated.

3,598,948

MINIATURE SQUARE OILTIGHT PUSHBUTTON SWITCH

Jack L. Bowen, Waseca, Minn., and Richard L. Chace, Bloomington, Ill., assignors to General Electric Company

Filed Apr. 24, 1970, Ser. No. 31,502
Int. Cl. H01h 13/58, 13/06
U.S. Cl. 200—159 R 6 Claims



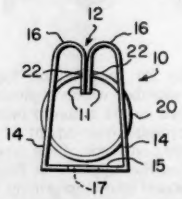
A miniature square oiltight pushbutton switch including a multipart elongated square housing one end of which receives and is closed by a contact and terminal supporting base plug and the other end of which is formed as an externally threaded cylindrical portion having a cylindrical bore, a hollow cylindrical bushing being received for reciprocal movement within the cylindrical bore, a two-piece knob assembly formed of a base and a lens cap being secured to the outer end of the bushing, a bore being provided in the aforesaid base for receiving an electrical lamp which illuminates the lens, the inner wall of the square segment of the housing being formed with a cylindrical bore surrounded by a plurality of alternately arranged splines and slots, alternate slots having barriers therein, the splines and slots cooperating with splines on the flanged portion of the aforesaid bushing and legs on a ratchet member such that the flanged portion and the ratchet member may reciprocate in the housing and the ratchet member may also rotate, a printed circuit card bearing against the ratchet member to move the bushing to its extended position, the end of the splines in the housing which face toward the base plug providing cam surfaces which cooperate with follower surfaces at the ends of the legs on the ratchet member to effect indexing rotation of the ratchet member in response to depression and release of the knob assembly.

3,598,949

SWITCH BREAK JAW AND SPRING MEANS

Chi-Tsan Hung, No. 14-1 Yen Ping St., Ku Shan, Kao Hsiung, Taiwan, China

Filed May 12, 1969, Ser. No. 823,562
Int. Cl. H01h 1/42
U.S. Cl. 200—166 E 5 Claims



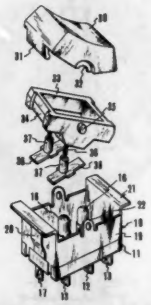
An electrical switch break jaw of the type formed in the shape of a U with an arcuate spring member supported by apertures in the walls of the jaw, wherein the arcuate spring provides a means for insuring a firm grip jaw and a means whereby the gap in the jaw remains constant.

3,598,950

ILLUMINATED MINIATURE SWITCH

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1969, Ser. No. 876,966
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 6 Claims



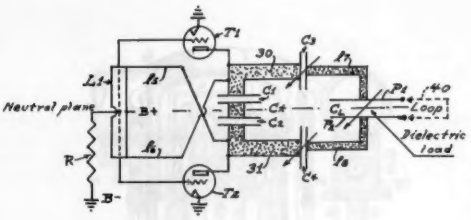
The illuminated switch assembly includes a pair of contact plates arranged in juxtaposed relation to each other at the bottom of the switch body and a lamp means disposed between said contact plates, with a terminal of said lamp being extended out a short distance from the inner bottom of the assembly. This arrangement permits thinned switch structure and also permits the lamp to be located substantially in the center of the switch assembly so that when the lamp is lighted, light is distributed evenly to the actuator which is detachably mounted over said lamp means.

3,598,951

SELF-EXCITED, SELF-TUNING AND SELF-LOADING GENERATOR IN WHICH THE LOAD IS AN INHERENT PART OF THE TANK CIRCUIT CAPACITANCE AND INDUCTANCE

Julius W. Mann, 9132 DeKoven Drive, S.W., Tacoma, Wash.

Filed Aug. 8, 1969, Ser. No. 848,656
Int. Cl. H05b *5/00, 9/04*
U.S. Cl. 219—10.75 7 Claims



A self-excited, self-tuning and self-loading generator in which the load electrode is an inherent part of the capacity and inductance of the generator tank circuit. The generator is automatically, instantly, and steplessly self-tuning with respect to wide variations in load characteristics. A maximum power input to the load is maintained by the generator and this is in proportion to changes in the loss factor of the load. The generator cannot "spill," i.e., detune from the load since the load is an inherent part of the tank circuit.

ERRATUM

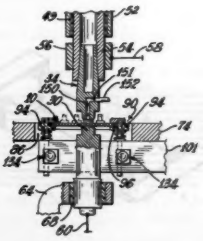
For Class 219—76 see:
Patent No. 3,598,944

3,598,952

METHOD AND APPARATUS FOR PRODUCING A STREAM FEEDER

Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Dec. 23, 1964, Ser. No. 420,740
Int. Cl. B23k *11/18, 11/02*
U.S. Cl. 219—107 11 Claims



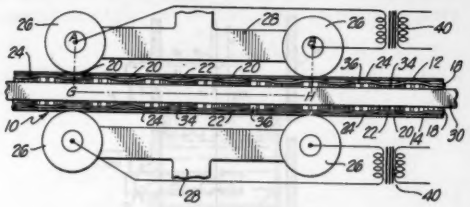
The disclosure embraces a method of and apparatus for joining elongated bodies fashioned of platinum alloy to a floor section or plate for a glass stream feeder wherein a flange on each body is provided with a linear ridge of restricted area which is fused or welded by electric current to the floor section or plate to establish a seal or bond between the body and the plate.

3,598,953

METHOD AND APPARATUS FOR BONDING METALLIC PANELS

James R. Campbell, 1504 Carmelita St., Laguna Beach, Calif.

Filed June 30, 1969, Ser. No. 844,718
Int. Cl. B23k *11/06*
U.S. Cl. 219—117 18 Claims



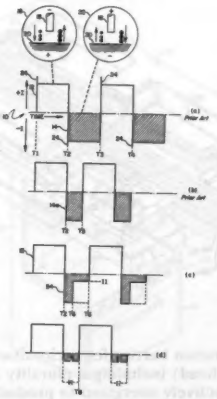
A method of bonding metallic panels wherein the panels consist of upper and lower metallic face sheets having a corresponding metallic core interposed therebetween, said method broadly involving the steps of preparation of the components of the panel by scrupulously cleaning the same and the subsequent steps of electrically bonding said components to each other to an extent sufficient to maintain them in operative relationship with each other but insufficient to enable the panel to sustain the loads and/or environment which it is designed to be subjected to. The subsequent step which places the components of the panel in such structural and operative relationship as to be able to be subjected to design loads and environments involves the heat bonding of the components of the panel to one another by the diffusion-bonding process or by analogous heat-bonding processes including such apparatus as induction-bonding apparatus and the like.

3,598,954

CONTROL FOR REVERSE-POLARITY WELDING

William F. Iceland, Los Alamitos, and Donald R. Lien, La Habra, both of, Calif., assignors to North American Rockwell Corporation and Air Products and Chemicals, Inc., Allentown, Pa., part interest to each

Filed May 12, 1969, Ser. No. 823,635
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R 6 Claims



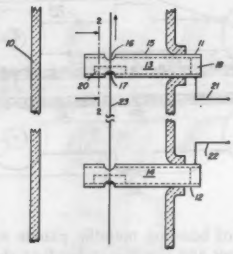
A reversing polarity arc-welding technique, wherein a welding current waveform has alternate "straight-polarity" portions and "reverse-polarity" portions; the reverse-polarity portion being desirable for its ionic cleaning, but being undesirable for its electron bombardment of the welding electrode. This disclosure teaches the advantages of reducing the welding current during the reverse-polarity interval; and discloses electronic circuitry for achieving this result.

3,598,955

ELECTRICAL CONTACT FOR MOVING FILAMENTS

Charles R. Morelock, Ballston Spa, N.Y., assignor to General Electric Company

Filed Apr. 4, 1969, Ser. No. 813,516
Int. Cl. C21d 9/62
U.S. Cl. 219—155 1 Claim



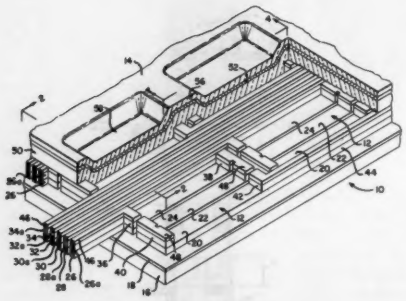
An electrical contact member is disclosed which comprises a horizontally disposed electrically conductive tube, a pair of apertures in the upper and lower portions of the side in registry with each other, and a pair of cylindrical rodlike electrically conductive members freely supported in said tube in contact with each other and both extending across the lower aperture. In operation, a pair of such members are supported in vertically spaced relationship and electrically isolated from each other, the apertures of each in substantial registry with the other. An electrically conductive filament is threaded through the apertures of each tube and between the rodlike bodies of each member and electric power is applied to each member to resistively heat the filament between the contact members.

3,598,956

ION MIGRATION BARRIER

Richard C. Cady, Jr., South Burlington, Vt., and John H. Hoskinson, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Aug. 11, 1969, Ser. No. 849,109
Int. Cl. H05b 1/00
U.S. Cl. 219—216 12 Claims



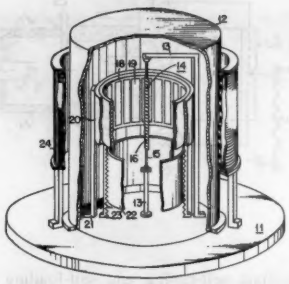
An ion migration barrier for a circuit configuration (like a thermal print head) including a plurality of resistor elements which are selectively energized to produce localized areas of heat. When the circuit configuration is used in an environment including a source of ions, the ions tend to migrate towards the resistor elements, thereby shortening resistor element life. The ion migration barrier (which is an electrically conductive shield) isolates the resistor elements from the source of ions when it is positioned therebetween to thereby prolong resistor element life. In a circuit configuration like a thermal print head, the source of ions appears to be the thermally sensitive paper which is used with the print head.

3,598,957

VACUUM DEPOSITION APPARATUS

Nobuaki Yasuda, Zushi-shi; Iwao Higashinakagawa, Kanagawa-ken, and Hiroaki Okamoto, Tokyo, all of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 10, 1969, Ser. No. 856,695
Claims priority, application Japan, Sept. 13, 1968, 43/65518
Int. Cl. C23c 13/00
U.S. Cl. 219—271 11 Claims



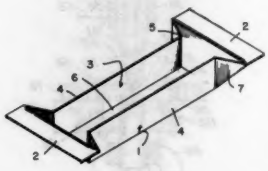
A vacuum deposition apparatus comprising a rodlike vapor deposition source vertically mounted substantially in the center of a vacuum vessel, a cylindrical member inside the vacuum vessel and surrounding the vapor deposition source which is located substantially at the central axis of the cylindrical member, a substrate being mounted on the inner surface of the cylindrical member, a shutter for selectively shutting off a deposition metal supplied from said rodlike vapor deposition source from being deposited on the substrate, and a coil for generating a magnetic field positioned outside said cylindrical member. A heater is optionally included to heat the substrate.

3,598,958

RESISTANCE HEATED EVAPORATION BOAT

Ernest A. Davey, Lynn, and Wallace T. MacDonald, Tewksbury, both of, Mass., assignors to Sylvania Electric Products Inc.

Filed Nov. 26, 1969, Ser. No. 880,186
Int. Cl. F22b 1/28
U.S. Cl. 219—275 6 Claims



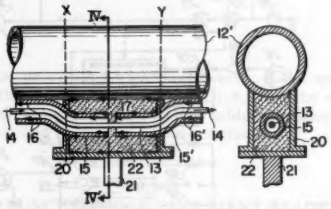
An electrically heated boat for the evaporation of powdered material comprises a thin folded sheet of tantalum arranged in the form of a container that holds a large volume of powder in relation to the size of the sheet. The ends of the boat are flat to permit clamping thereof to the electrical posts of a vacuum evaporation apparatus. Excessive operating temperature variations throughout the boat are avoided by fabricating the boat so as to maintain substantially uniform wall thickness therethroughout.

3,598,959

METHOD FOR PARTIALLY INCREASING HEAT TO BE GENERATED IN A HEAT-GENERATING PIPE UTILIZING SKIN EFFECT CURRENT

Masao Ando, Yokohamashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Aug. 6, 1970, Ser. No. 061,694
Claims priority, application Japan, Aug. 19, 1969, Nov. 8, 1969, 44/65488; 44/89438
Int. Cl. H05b *3/00*
U.S. Cl. 219—300 8 Claims



In a heat-generating pipe composed of a ferromagnetic pipe or pipes and an insulated wire passing therethrough, and having such a circuit that alternating current flowing through said ferromagnetic pipe flows concentratedly only on the inner skin portion of the ferromagnetic pipe, the ferromagnetic pipe is cut and divided into two portions, within a section where increase of heat to be generated is required, and the two points on the outer surfaces of the divided ferromagnetic pipes at both the ends of the section are connected by a conductor, whereby, within the section, AC flows also on the outer skin portion of the ferromagnetic pipes, and the amount of heat to be generated within the section is increased.

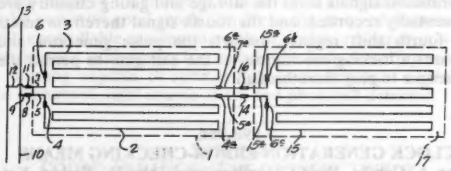
Further, within the section, a ferromagnetic ring or rings are strung on the ferromagnetic pipe(s), whereby an induction current flows on the ring(s) correspondingly to the AC flowing through the outer skin portions of the ferromagnetic pipe(s), and the amount of heat to be generated within the section can be further increased.

3,598,960

RADIANT CEILING HEATING UNIT

George P. Deacon, 158 Poplar Ave., Wheeling, W. Va.

Filed July 3, 1969, Ser. No. 838,888
Int. Cl. H05b *1/00*; F24h *9/02*
U.S. Cl. 219—345 2 Claims



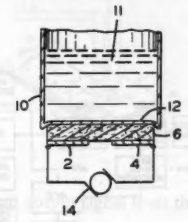
The present radiant ceiling heating unit consists of two heating panels to a unit with the panels of each unit electrically connected by nonheating jumper leads which permits the panels of a unit to be mounted on a ceiling lengthwise between a pair of the ceiling joists or installed side-by-side each on an opposite side of one of such ceiling joists and includes a clip for each pair of nonheating leads at an end of a panel to prevent the leads from being pulled from the panel end.

3,598,961

METALLIC CONTAINER WITH AN INTEGRAL SPLIT-ELECTRODE SERIES-LAMINATED HEATER

Nathaniel E. Hager, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 29, 1969, Ser. No. 861,694
Int. Cl. F27d *11/02*
U.S. Cl. 219—438 1 Claim



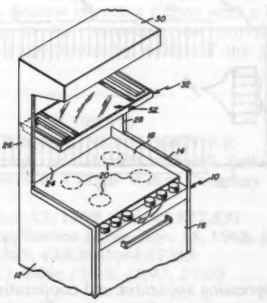
The electrical heater is provided for heating containers of food. The wall of the container may constitute a portion of the heater structure or the heater may be composed of three laminated structures fastened to a food container. The heater has a split electrode, both parts on the same side of an electrically conductive material. On the opposite side of the conductive material is the wall of the container or a conductive sheet. Principal current flow is from one of the split electrodes through the conductive layer to the large conductive sheet and then back through the conductive layer to the second split electrode.

3,598,962

RANGE WITH ELEVATED WARMING TRAY

William C. Badnaruk, Elverson, and Peter L. Helgeson, Macungie, both of, Pa., assignors to Caloric Corporation, Topton, Pa.

Filed Dec. 29, 1969, Ser. No. 888,546
Int. Cl. H05b *3/68*
U.S. Cl. 219—444 8 Claims

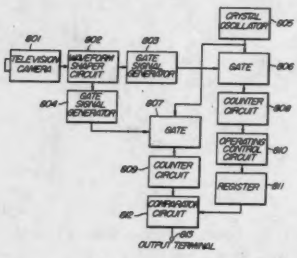


A kitchen range having a cooking top and having thereabove a hinged shelf containing an electrical warming tray, and means for interconnecting the tray into an electrical circuit when the shelf and tray thereon are in lowered position.

3,598,963
CURVE READER

Kinichiro Osugi, and Takashi Yumoto, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan

Filed June 1, 1967, Ser. No. 642,810
Claims priority, application Japan, June 10, 1966, June 10, 1966, June 10, 1966, June 10, 1966, June 10, 1966, June 10, 1966, 41/37850;41/37851;41/37852;41/37853;41/37854;41/37855
Int. Cl. G06k 9/00
U.S. Cl. 235—61.6 A 11 Claims

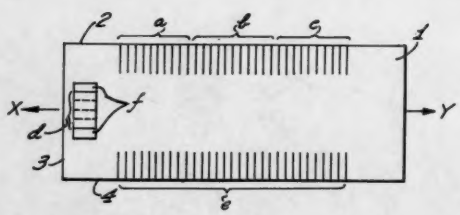


This specification discloses a device for reading out a curve recorded on a recording paper by means of a television camera, by which an error due to the shift of the recording paper and nonlinearity of sweep are compensated, whereby the readout of the curve on the recording paper is performed in greater accuracy and stability.

3,598,964
DATA PROCESSING SYSTEMS AND APPARATUS THEREFOR

Robert Dell, Sudbury, England, and John Benjamin Crews, Los Angeles, Calif., assignors to Advance Data Systems Corporations, Beverly Hills, Calif.

Continuation-in-part of application Ser. No. 460,771, June 2, 1965, now abandoned. This application Dec. 6, 1967, Ser. No. 688,422
Int. Cl. G06k 7/08
U.S. Cl. 235—61.6 R 7 Claims

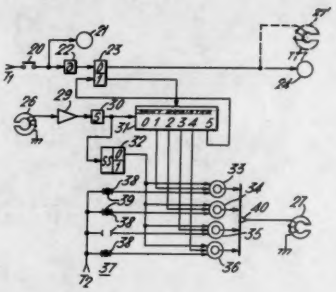


Data processing apparatus and cooperating tickets adapted for use in a transportation system. The ticket has fare data encoded on one side, as well as direction-of-travel indicia. Reading heads will read the indicia on the ticket irrespective of ticket orientation. Gate circuits responsive to a direction-of-travel indicia-reading head and data-reading heads place the data read into a storage register with the digits in proper significant order, whether the highest or lowest significant digit is read first. The read data is then compared with preset data, and a barrier release signal is provided if the read data is satisfactory.

3,598,965
METHOD OF AND APPARATUS FOR AUTOMATICALLY EXAMINING RAILWAY TICKETS OR THE LIKE

Sizuya Ano; Masanori Nagata, and Tadao Morita, all of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 15, 1967, Ser. No. 690,903
Claims priority, application Japan, Dec. 23, 1966, 41/84215
Int. Cl. G06k 17/00; G07f 7/02; H04a 9/00
U.S. Cl. 235—61.7 R 5 Claims



To permit a passenger to choose his range of journey on a transportation system, a ticket for use therefor includes two recording areas, one having an identification number and the other providing for recording of the station at which the ticket is last used. The passenger inserts the ticket into an entrance gate wherein a sensor actuates a first shift register which in turn steps gating circuitry to apply a predetermined station number to the second area in synchronism with a plurality of synchronizing marks thereon. The passenger is then allowed to retrieve his ticket and pass through the gate. When he has completed his journey, he inserts the ticket into an exit gate wherein a sensor actuates a second shift register which transfers, in synchronism with the synchronizing marks, the recorded station number to storage circuitry. The exit gate then transmits an identification signal to a common controller which also receives similar identification signals from other stations. The controller includes a third shift register which is stepped by a pulse generator. The outputs of the third shift register are compared with the plurality of identification signals; when a comparison is made, the common controller sends a recognition signal to the particular station, stops the pulse generator and actuates a recorder. The recorder then sequentially issues four signals which are combined with the identification and recognition signals to step a fourth shift register at the exit gate. The outputs from the fourth shift register in turn interrogate the storage circuitry containing the recorded station number, gating circuitry which reads the identification number off the ticket, and gating circuitry including the exit station number. These information signals from the storage and gating circuitry are sequentially recorded, and the fourth signal therefrom resets the fourth shift register, restarts the pulse generator and releases a locking mechanism at the exit gate to permit the passenger to pass therethrough.

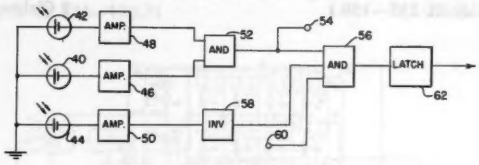
3,598,966
CLOCK GENERATION ERROR-CHECKING MEANS

Jerry A. Combs, West Carrollton, and John W. Fecher, Kettering, both of, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 27, 1968, Ser. No. 740,562
Int. Cl. G06k 7/10
U.S. Cl. 235—61.11 E 11 Claims

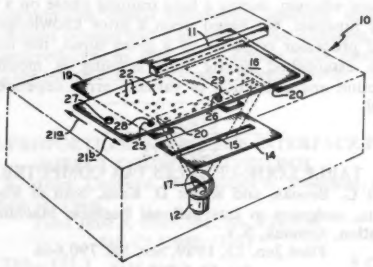
Means for preventing an undetected loss of data from tape being sensed by a tape-sensing device, which loss may occur when a sprocket hole being used for clocking purposes is obstructed or defective so that a clock signal cannot be generated therefrom. The addition of a sprocket-hole-sensing device and electrical circuitry for generation of an error signal in response to failure to sense the sprocket hole ena-

bles a check to be made in advance as to whether or not the sprocket hole of a frame of data to be subsequently sensed is unobstructed. If a satisfactory signal is obtained from sensing of the sprocket hole, then sensing of the tape by the tape-



sensing device proceeds normally. However, if the sprocket hole in question is obstructed or defective, then the normal sensing signal is not produced by the added sprocket-hole-sensing device, and an error signal is generated.

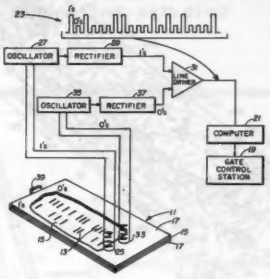
3,598,967
CODED PUNCHED HOLE DOCUMENT READER
Robert M. Berler, Westport, Conn., assignor to Pitney Bowes-Alpex, Inc., Danbury, Conn.
Filed June 23, 1969, Ser. No. 835,372
Int. Cl. G06k *7/14*
U.S. Cl. 235—61.11 E **5 Claims**



An apparatus for reading intelligence contained on a document in the form of coded punched holes which includes novel means to produce registration between the spaced punched holes in the document and the respective photoelectric cells whose spacing in the array may differ from the spacing of the holes in the document. A simple inexpensive arrangement comprising a standard lamp and a mask is used to simulate a point source of light which in turn permits a magnified image of the punched hole array of a coded document to be cast with good resolution on to the array of photocells with controllable spacing to produce precise registration with the respective photoelectric cells in the hole-detecting array. A housing capable of substantially excluding light contains the document, light source, mask and photocell detector.

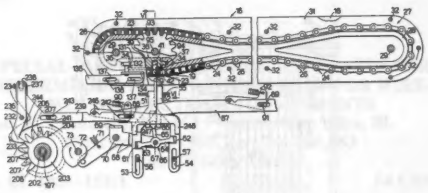
3,598,968
CODED ARRANGEMENT OF INDUCTIVELY DETECTABLE ELECTRICAL CONDUCTING SEGMENTS
Richard A. Victor, Danville, Calif.
Filed Feb. 3, 1969, Ser. No. 795,808
Int. Cl. G06k *7/00, 19/00;* **G01n** *27/86*
U.S. Cl. 235—61.11 R **13 Claims**

An identification badge in which a coded arrangement of nonmagnetic electrically conductive segments are embedded for successive presentation to a coil of an oscillator with which eddy currents are induced in each segment as the badge is manually moved past the coil. The oscillator normally is oscillated to produce reference signals that are rectified to obtain a reference output level. Upon a segment being moved adjacent the coil, the oscillator becomes loaded and the amplitude of its signals reduced to provide a cor-



responding rectified output signal level that is lower than the reference level.

3,598,969
SETTABLE PROGRAM CONTROL DEVICE FOR AN ACCOUNTING OR SIMILAR MACHINE
Nicolo Giolitti, and Gian Paolo Guerrini, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C. S.p.A., Ivrea, Italy
Filed Jan. 13, 1969, Ser. No. 790,539
Claims priority, application Italy, Jan. 22, 1968, 50219 A/68
Int. Cl. G06c *1/00*
U.S. Cl. 235—123 **22 Claims**

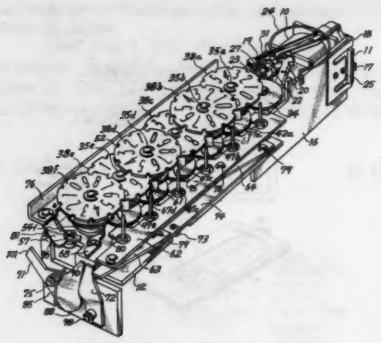


A keyboard-settable ball memory for program control of accounting and similar machines is disclosed in which the balls are positioned in longitudinal columns and transverse rows of cells in an endless traveling ribbon with a fixed station corresponding to one transverse row providing both setting and sensing operations by means of the same elements.

3,598,970
ELECTROMAGNETIC COUNTER
Nagao Mizutani, Tokyo, and Hiroshi Mabuchi, Saitama, both of, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan
Filed Nov. 17, 1969, Ser. No. 877,531
Claims priority, application Japan, Nov. 15, 1968, July 19, 1969, 43/83649;44/57319
Int. Cl. G06c *15/26, 15/42, 27/00*
U.S. Cl. 235—137 **10 Claims**

An electromagnetic counter having an electromagnetic driving means, a reduction gearing connected to the driving means and indicating members such as figure wheel or dial to indicate a count. The reduction gearing includes counting gear assemblies rotated in accordance with a scale such as decimal system, and the counting gear assemblies accumulate the kinetic energy in resilient members such as springs for rotating the indicating members. Each of the indicating members is adapted to be rotated one pitch by the accumulated kinetic energy for every transferring signal from the previous

column. In addition the electromagnetic counter is provided with a zero-setting means. To accomplish the zero-setting



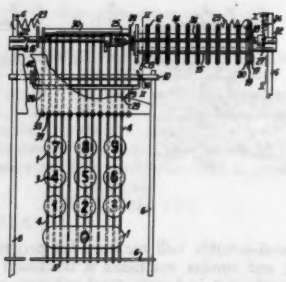
operation, the reduction gearing is adapted to be disconnected.

3,598,971

DEVICE FOR INTRODUCING VALUES INTO A CALCULATING MACHINE, HAVING A REDUCED KEYBOARD

Andre Kolly, Geneva, Switzerland, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 26, 1969, Ser. No. 853,106
Claims priority, application Switzerland, Sept. 3, 1968, 13,207/68
Int. Cl. G04b *5/20*
U.S. Cl. 235—145 **1 Claim**



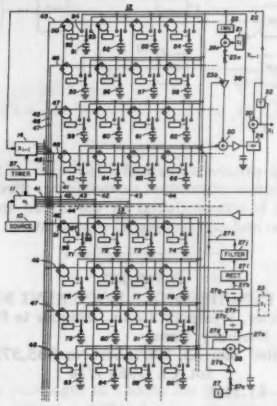
A device for introducing values into a calculating machine has a simplified keyboard with only 10 keys, each bearing a different digit. A control member is connected to each of the keys and a positioning member is connected to one end of the control member. A side plate follows the movement of the control member and has a retaining member on one end. Two shafts parallel to each other are mounted on the device, and a registering device with movable teeth is loosely mounted on one of the shafts for movement lengthwise of the shaft. A rack bar engages with one end of the registering device and extends in the direction of the associated shaft. An escapement member is rigidly mounted on the other shaft and engages with the rack bar to limit the movement of the registering device. The escapement and the retaining member cause the stepwise advance of the intermediate registering device. The positioning member is placed in the path of the movable member corresponding to the control member of the depressed key during the movement of the registering device lengthwise of its associated shaft. As a result, the movable member is displaced from its rest position into its operating position upon that movement of the registering device.

3,598,972

ADAPTIVE WEIGHTING IN TRAINING FEEDBACK MINIMIZED OPTIMUM FILTERS AND PREDICTORS

William C. Choate, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 23, 1968, Ser. No. 786,059
Int. Cl. G05 *13/02*
U.S. Cl. 235—150.1 **8 Claims**



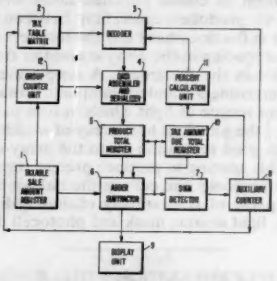
Training control is provided for a nonlinear adaptive signal processor wherein, during a long training phase on a nonstationary function, but based upon a prior knowledge of the desired processor response to a given input, the inertia to change established during long training is modified by production and utilization of variable error dependent gain control.

3,598,973

TABLE LOOK-UP SALES TAX COMPUTER

Everett G. Brooks, and Roger D. Kaus, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1969, Ser. No. 790,646
Int. Cl. G06f *7/48*
U.S. Cl. 235—168 **7 Claims**

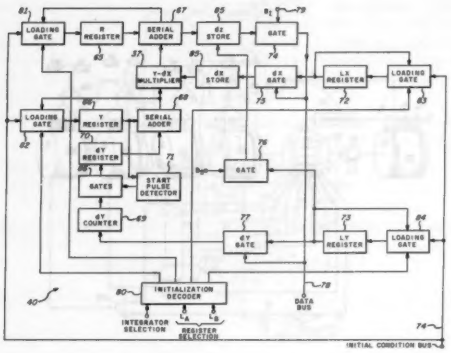


A computer including a register containing an initially proposed trial value of sales tax for a given actual sales price, a tax matrix to determine the cutoff sales price for that trial tax, a subtractor for determining if the actual sales price is larger than the cutoff sales price, logic elements for repetitively proposing the next higher trial value if the actual sales price is larger, means to use the calculated tax if the actual sales price is not larger, and means to compute the tax as a percentage of the sales price if the highest programmed trial tax is smaller than the actual tax.

3,598,974
PROGRAMMABLE DIGITAL DIFFERENTIAL ANALYZER INTEGRATOR

Andrew James Lincoln, Concord, Mass., assignor to Sperry Rand Corporation

Filed Sept. 15, 1967, Ser. No. 667,995
Int. Cl. G06f 15/06; G06g 7/62
U.S. Cl. 235—150.31 22 Claims

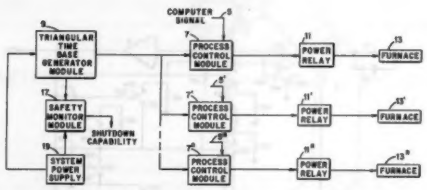


A programmable digital differential analyzer integrator which contains storage and logic circuits for changing its effective interconnections with other similar units merely by changing the information temporarily stored therein.

3,598,975
TIME-PROPORTIONING PROCESS INTERFACE FOR DIRECT COMPUTER CONTROL

William R. Miller, Concord, and Charles A. Mossman, Knoxville, both of, Tenn.

Filed June 3, 1969, Ser. No. 829,913
Int. Cl. G05b 11/01
U.S. Cl. 235—151.1 5 Claims

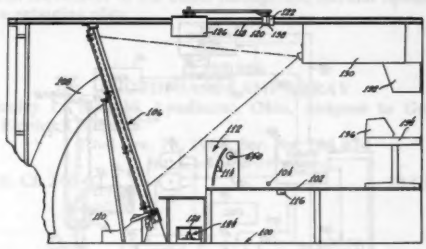


An interface device has been provided which converts a computer-derived analog control signal to a time-proportioning signal for controlling a process. A plurality of control modules, one for each process, are fed by separate computer-derived control signals together with a commonly applied triangular time base signal. The triangular time base signal is generated in a unique manner by means of a loop connected amplitude controlled ramp function generator and a differentiator. The time base signal is compared with the analog computer signal in each process control module to produce a time-proportioning (on-off) signal to the final control element associated with that module.

3,598,976
GOLF GAME COMPUTING SYSTEM

Jack A. Russell, and Bradford J. Baldwin, both of Muskegon, Mich., assignors to Brunswick Corporation

Division of Ser. No. 588,922, Oct. 24, 1966, Pat. No. 3,513,707.
Filed Sept. 29, 1969, Ser. No. 861,944
Int. Cl. G06g 7/48; A63b 67/02
U.S. Cl. 235—151 13 Claims

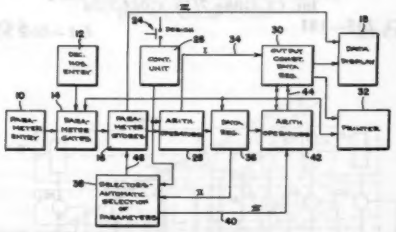


A computer system for use in indoor golf games. The system includes data acquisition means for obtaining data relative to the trajectory of a golf ball hit from a tee, a means for receiving the trajectory information and for providing a signal whose magnitude is representative of the initial velocity of the golf ball; a means for decaying the magnitude of the signal at a predetermined rate to provide a second signal whose magnitude is representative of the instantaneous velocity of a golf ball at any corresponding point in the theoretical time of flight of the golf ball; and a display device for utilizing the second signal to provide information relative to the theoretical free flight trajectory of the golf ball to a golfer.

3,598,977
SPECIAL-PURPOSE COMPUTING APPARATUS FOR DETERMINING CONSTRUCTION DATA FOR WIRE-WOUND ELECTRICAL COMPONENTS

James H. Clemmons, 2 N 461 Pleasant, Glen Ellyn, Ill.

Filed Oct. 11, 1968, Ser. No. 766,683
Int. Cl. G06g 7/48
U.S. Cl. 235—151.1 14 Claims



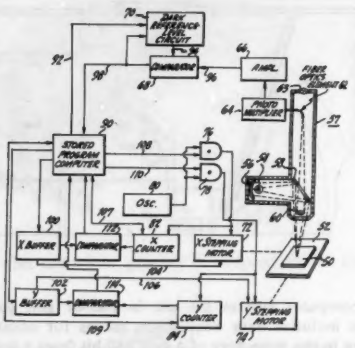
Apparatus for determining the values of construction parameters required for constructing wire wound electrical components, such as a power transformer, in accordance with certain essential and optional input design parameters, including storage means for receiving and storing data relating to the essential input design parameters, memory means for storing empirical data relating to the values of the optional parameters as a function of the essential parameters, selector means responding to the values of the entered essential parameters in the storage means for selecting from the stored empirical data the respective values of the optional input design parameters, and controlled calculating means operationally connected to the storage means and to the selector means for determining the respective values of the required construction parameters.

3,598,978

OBJECT-POSITIONING SYSTEM AND METHOD

Lawrence A. Rempert, Cranbury, N.J., assignor to RCA Corporation

Filed Aug. 21, 1968, Ser. No. 754,228
Int. Cl. G06f *15/46*; G01n *21/32*
U.S. Cl. 235—151.11 **6 Claims**



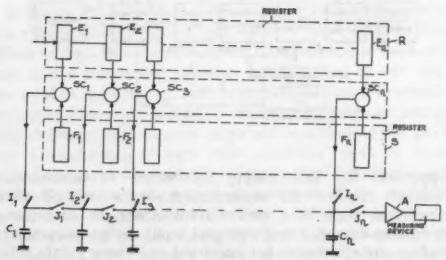
The object which is to be positioned has light and dark areas and edges which define transitions between these areas. This object is placed beneath a light-sensing element such as an optical fiber. The object is then moved first in one direction and then in another direction to determine, with the aid of the light-sensing element and other means, the distances, in a given plane, between the initial position of the light-sensing element and two of the edges. This procedure may be repeated for other pairs of edges and the measured distances may be employed to determine and to correct the initial error in the object position.

3,598,979

DIGIT SEQUENCE CORRELATOR

Jean Pierre A. Moreau, Paris, France, assignor to CSF-Compagnie Generale De Telegraphie Sans Fil

Filed Jan. 17, 1969, Ser. No. 792,103
Claims priority, application France, Jan. 26, 1968, PV 137 628
Int. Cl. G06g *7/19*; G06f *7/04*
U.S. Cl. 235—181 **5 Claims**



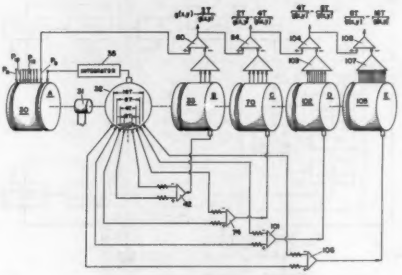
A digital correlator able to recognize, within a digital message, a sequence of *n* predetermined digits, comprises a shift-register with at least *n*-stages in which there is stored the sequence to be recognized, a second register identical to the first, into which the incident sequence is fed, and an *n*-stage comparator which, stage by stage, compares the states of the two registers.

3,598,980

METHOD OF AND APPARATUS FOR DETERMINING AREA GRAVITY

Philip L. Lawrence, Riverside, Conn.; Gilbert W. Ehlert, Dallas, Tex.; John A. Lester, Dallas, Tex., and Albert W. Musgrave, Dallas, Tex., assignors to Mobil Oil Corporation

Continuation of application Ser. No. 330,413, Dec. 13, 1963, now abandoned. This application Sept. 22, 1969, Ser. No. 860,117
Int. Cl. G01v *7/06*; G06f *15/34*; G06g *7/18*
U.S. Cl. 235—181 **14 Claims**



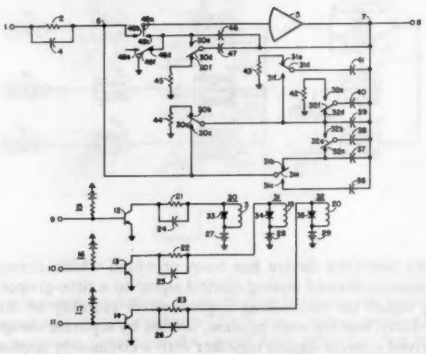
Gravity profiles are smoothed by differing smoothing intervals. Several of the smoothed profiles are then combined, or averaged, to form an averaged area gravity value. The averaged area gravity values are subtracted one from another to generate a plurality of difference area gravity values. Each of these difference area gravity values accentuates an anomaly in a different depth range.

3,598,981

CAPACITOR-SWITCHING CIRCUIT

Ben D. Conger, West Long Branch, and Alfred G. Tonnessen, Neptune, both of, N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Mar. 18, 1969, Ser. No. 808,094
Int. Cl. G06g *7/18*
U.S. Cl. 235—183 **2 Claims**



A circuit is disclosed providing six time scales for an analog integrator by selectively connecting only three input terminals and automatically connecting the proper valued HOLD capacitor for the resultant time scale.

3,598,982

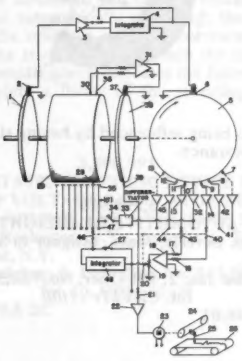
SYSTEMS FOR MODIFYING FUNCTIONS INCLUDING A CONVOLUTION OPERATION

Philip L. Lawrence, Riverside, Conn., assignor to Mobil Oil Corporation

Continuation of application Ser. No. 309,462, Sept. 17, 1963, now abandoned. This application Aug. 8, 1967, Ser. No. 659,235

Int. Cl. G06g 7/19; G01v 7/36

U.S. Cl. 235—197 8 Claims



A convolution technique in which a function to be filtered is convolved with an operator of a selected character. In this manner, low-pass, high pass and band-pass type filtering or any combination thereof can be achieved.

Convolution of a function which varies in amplitude along a scale with an operator including positive and negative step functions spaced along the scale will produce low-pass filtering of the function.

3,598,983

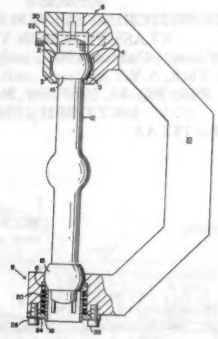
ARC LAMP MOUNTING STRUCTURE

Emil A. Mosser, Jr., Newport Beach, Calif.

Filed Apr. 11, 1969, Ser. No. 815,431

Int. Cl. F21v 21/00

U.S. Cl. 240—41 A 1 Claim



A mounting structure in which an arc lamp is positioned without inducing stresses in the lamp during high-loading environments. The lamp has a spherical ferrule placed around each end. One spherical ferrule is then clamped tightly between a recessed surface in one end of the mounting structure and a pressure plate having a like recessed surface. The pressure plate is firmly tightened on the one spherical ferrule in a perpendicular direction relative to the lamp by a plurality of clamping screws connected to the one end of the mounting structure. The other spherical ferrule fits into a cylindrically bored hole of the other end of the mounting structure and is restricted to movement in only the axial direction. A spring-loaded collet is positioned in a counter bore of the cylindrically bored hole and is compressed against the other spherical ferrule. A retaining plate having a circular opening in which the collet can move axially holds the spring in compression against the collet by a plurality of retaining screws. The retaining screws secure the retaining plate to the other end of the mounting structure for allowing axial movement of the collet through the circular opening of the retaining plate.

3,598,984

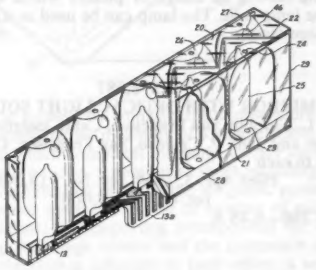
PHOTOFLASH LAMP ARRAY

Stanley L. Slomski, Lyndhurst, Ohio, assignor to General Electric Company

Filed Dec. 16, 1968, Ser. No. 784,074

Int. Cl. G03b 15/02

U.S. Cl. 240—1.3 10 Claims



A multilamp photoflash array with lamp reflector units in linear rows facing in opposite directions with the reflectors of each row nested into the reflectors of the opposite row. Insulation means between rows of reflectors and convection cooling means minimize distortion of adjacent reflectors on flashing of lamps.

3,598,985

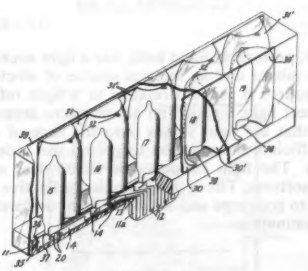
CONSTRUCTION OF DISPOSABLE PHOTOFLASH LAMP ARRAY

John D. Harnden, Jr., and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company

Filed Dec. 16, 1968, Ser. No. 784,075

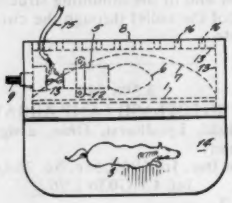
Int. Cl. G03b 15/02

U.S. Cl. 240—1.3 21 Claims



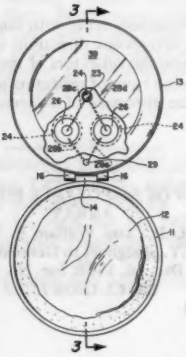
A disposable flashbulb or photoflash lamp array designed for use with static electronic flashing circuits comprises a rigid pluggable single-bladed or multibladed printed circuit contact member, preferably having a metallic substrate, that mounts a planar or linear group of lamps together with reflectors, if desired, and a transparent envelope in a low cost sturdy construction with a reliable contact system. The reflectors can be integral with the pluggable contact member.

3,598,986
TELEVISION AND NIGHT LIGHT
Clyde W. Love, 6650 W. 33rd Ave., #11, Wheat Ridge, Colo.
Filed July 3, 1969, Ser. No. 838,744
Int. Cl. F21v *33/00*; G09f *13/18*
U.S. Cl. 240—2 AD 2 Claims



A lamp having an image or picture which is illuminated when the lamp is lit. The lamp can be used as a night light or a television lamp.

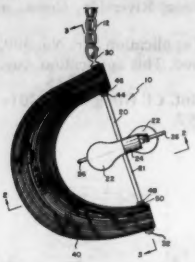
3,598,987
MIRROR WITH OPTICAL LIGHT SOURCE
Vernon L. Kipping, San Francisco, Calif., assignor to J. Roger Jobson and John P. Costello, San Francisco, Calif., part interest to each
Filed Apr. 3, 1968, Ser. No. 718,390
Int. Cl. F21v *33/00*
U.S. Cl. 240—6.45 R 9 Claims



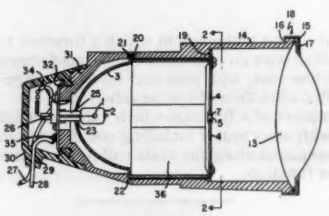
A mirror, preferably hand held, has a light source disposed behind the mirror and an integral source of electric current. The light source is located relative to a light reflective surface to direct light through an annular lens surrounding the mirror so that the light shines onto the face of the user to provide sufficient illumination to permit use independent of other light. The light produced is shadowless and characterized by softness. The systems employ reflective and refractive optics to converge and distribute light uniformly over the field of illumination.

3,598,988
DECORATIVE HANGING LAMP WITH ADJUSTABLE SHADE
Richard A. Link, Box 211, Jackson, Wyo.
Filed May 21, 1969, Ser. No. 826,560
Int. Cl. F21p *1/02*; F21v *1/00*
U.S. Cl. 240—10 R 15 Claims

A lamp hanging from a chain or the like has a tube depending from the chain, electric bulb means supported medially of the tube, and a series of slats made of wood or the like of generally semicircular shapes, having their ends secured to upper and lower portions of the tube. The slats are pivotal to various adjusted positions for decorative effects, the decorative effects also being influenced by having slats in the series contrast in appearance.

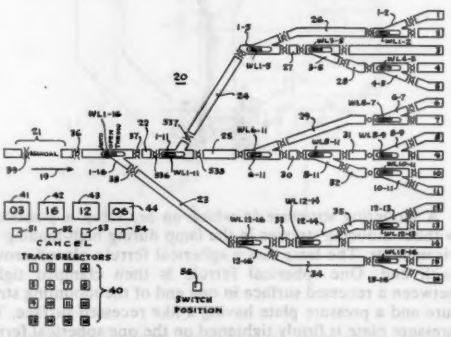


3,598,989
AUTOMOTIVE HEADLIGHT
Orrick H. Biggs, Beverly, Mass., assignor to Sylvania Electric Products Inc.
Filed Jan. 2, 1969, Ser. No. 788,518
Int. Cl. F21v *11/00*
U.S. Cl. 240—46.01 4 Claims



An automotive headlight having a light source at one focus of an ellipsoid, an aperture at the other focus, the aperture being coated with a rim of glass to diffuse the light near the edges of the aperture. A lens focuses the aperture on the roadway.

3,598,990
ROUTE-SWITCHING SYSTEM FOR RAILROAD CLASSIFICATION YARD
Robert W. Convey, Oakland, N.J., assignor to Abex Corporation, New York, N.Y.
Filed July 10, 1969, Ser. No. 840,688
Int. Cl. B011 *17/00*
U.S. Cl. 246—182 AA 13 Claims



A route-switching control system, for a railroad classification yard, in which each route command, upon entry into the

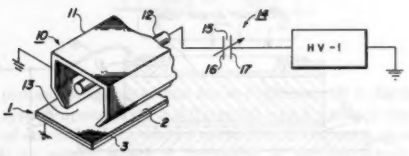
system, is transferred downstream to individual storage units (one for each track switch in the yard and each capable of storing a single route command) as far as possible, depending upon prior entry of other route commands. The track switches of the yard are aligned in accordance with each route command as received. As each car or cut of cars enters a track switch, the storage unit for that track switch is cleared automatically and any route command pertaining to that track switch which may be waiting in an upstream storage unit is then entered in the storage unit. If a "catchup" occurs, with two separate cuts approaching each other too closely to be separated in subsequent yard operations, the route command for the cut catching up with a preceding cut is automatically cancelled; the system effectively notifies the operator of the occurrence of a catchup and identifies the track switch at which the catchup has occurred. An automatic alarm indicates the failure of any track switch to complete a throw or the recycling of any track switch.

3,598,991

ELECTROSTATIC CHARGING DEVICE HAVING A SPARK GAP VOLTAGE REGULATOR BETWEEN A CORONA SOURCE AND A VOLTAGE SOURCE

Louis N. Nost, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,865
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.5 ZC **14 Claims**



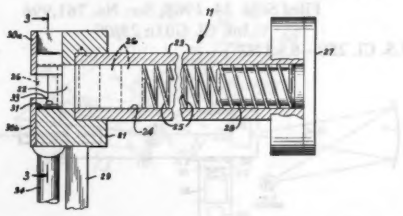
A corona-charging device including a corona wire surrounded by a grounded conductive shield. The corona wire is connected to either a positive or negative high-potential source. Inserted in the circuit between the wire and the source is an airgap which draws an arc at high voltages.

3,598,992

DIFFRACTOMETER WITH AUTOMATIC SAMPLE CHANGER

Joseph Edwin Bridge, Jr., Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Jan. 8, 1969, Ser. No. 789,755
Int. Cl. H01j *37/20;* **G01n** *23/20*
U.S. Cl. 250—51 **1 Claim**



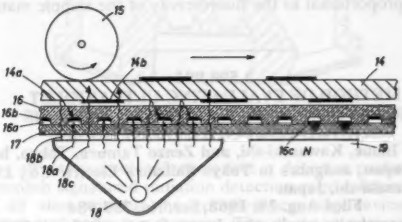
A diffractometer with automatic sample-changing means which is actuated to change the sample to be exposed to the X-ray beam upon completion of each excursion through its range of values of the angle made by the incident beam to the surface irradiated.

3,598,993

IMAGING APPARATUS USING A MAGNETIZABLE PRINTING INK WITH A TEMPERATURE DEPENDENT MAGNETIC PERMEABILITY

Helmut Kaufer, Gruenwald near Munich; Erich Burger, Unterhaching near Munich, and Hans-Peter Huber, Munich, all of, Germany, assignors to Agfa Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 428,964, Jan. 29, 1965, Pat. No. 3,472,695.
Filed Mar. 6, 1969, Ser. No. 804,777
Int. Cl. B05b *5/02;* **G03g** *15/14*
U.S. Cl. 250—65 T **8 Claims**



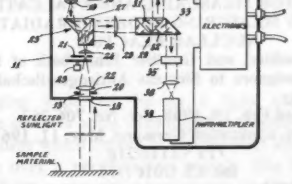
An image is formed by utilizing the temperature dependency of the magnetic permeability of a magnetizable material, in a device which comprises an image carrier carrying an image to be reproduced, a composite sheet including a layer comprising magnetizable material the magnetic permeability of which depends upon the extent of heating of such magnetizable material, a transporting arrangement for concurrently moving the image carrier and the composite sheet in superposed relationship adjacent to each other, a source of heat for selectively heating the composite sheet, while in such superposed relationship, corresponding to the image on the image carrier so that on the composite sheet a selective pattern of portions of the magnetizable material having a predetermined magnetic permeability range will be formed, which portions will correspond to the image on the image carrier, and a source of magnetic force located downstream of the heat source in the direction of movement of the composite sheet so that magnetic force will be exerted on the portions of the magnetizable material forming the selective pattern of predetermined permeability range.

3,598,994

METHOD AND APPARATUS FOR SENSING FLUORESCENT SUBSTANCES

David A. Markle, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 19, 1968, Ser. No. 760,834
Int. Cl. G01n *21/22*
U.S. Cl. 250—71 **10 Claims**



A method and apparatus for sensing fluorescent radiation emitted by a sample material using sunlight as the source of exciting radiation. A bundle of direct sunlight is encoded and

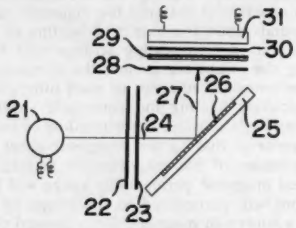
split into beams each of which is combined with similar portions of a bundle of light containing solar reflected and solar-excited fluorescent energy components from the sample material. The sample bundle is encoded differently from the direct sunlight or reference bundle so that it may be distinguished subsequently. The two beams (each of which contain reference and sample components) are passed through two spectral filters and detected photoelectrically. One of the spectral filters is centered on a Fraunhofer absorption line. The other filter is centered a few Angstroms away in the solar continuum. The four signals corresponding to the intensity of the sample and reference beam components passing through each of the two spectral filters are separated electronically and combined in an analogue computer to yield a signal proportional to the fluorescivity of the sample material.

3,598,995

METHOD OF EVALUATING ULTRAVIOLET RADIATIONS AND QUALITATIVE ANALYSIS INVOLVING SUCH EVALUATIONS

Masao Inoue, Kawasaki-shi, and Zenzo Tamura, Tokyo, both of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 28, 1968, Ser. No. 755,984
Claims priority, application Japan, Oct. 9, 1967, 64720/67
Int. Cl. G01n *21/22*
U.S. Cl. 250—71 R **4 Claims**



Evaluation of wavelengths of ultraviolet radiations is made by irradiating a mixture of two or more specific fluorescent substances, that exhibit different excitation and emission spectra from each other, with ultraviolet rays of unknown wavelengths, identifying distinctive visible colors exhibited by the irradiated mixture and comparing these colors with standard colors which the mixture exhibits when irradiated by ultraviolet rays of known wavelength. Such evaluations are used for the qualitative analysis of sampled materials.

ERRATUM

For Class 250—67 see:
Patent No. 3,598,060

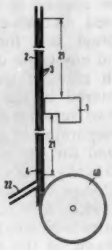
3,598,996

APPARATUS FOR MEASURING AND EVALUATING THE ACTIVITY OF MEASURING PROBES IRRADIATED IN A NUCLEAR REACTOR

Dietrich V. Haebler, and Gunther Jahn, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Feb. 19, 1968, Ser. No. 706,262
Claims priority, application Germany, Mar. 11, 1967, S 1 08 775 V111c/21g
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **6 Claims**

A plurality of measuring probes are sequentially positioned in a conveyor tube in the vicinity of a measuring and evaluating device for determining the activity in each probe. The probes are moved in sequence by a control unit into operative proximity with the measuring and evaluating device. The control unit comprises an elastic wire in the tube blocking



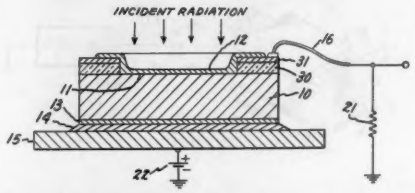
the probes and a moving device for controllably withdrawing the wire from the tube.

3,598,997

SCHOTTKY BARRIER ATOMIC PARTICLE AND X-RAY DETECTOR

Richard D. Baertsch, Scotia, N.Y., assignor to General Electric Company

Filed July 5, 1968, Ser. No. 742,654
Int. Cl. G01t *1/24;* **H01l** *15/00*
U.S. Cl. 250—83 **3 Claims**



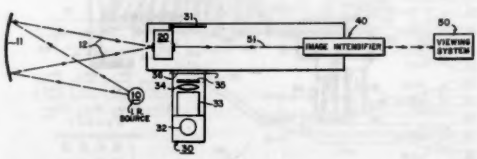
A solid-state atomic particle and X-ray detector comprising an N-type semiconductor crystal of high atomic number, coated with a metallic film of low atomic number. By making the metal-to-semiconductor interface abrupt, a Schottky barrier-type junction is produced. Atomic particles or X-rays can easily penetrate the metallic film but are absorbed in the semiconductor near the interface, producing electron-hole pairs in the depletion region. Holes which diffuse beyond the depletion region give rise to a current indicative of detection of X-rays or atomic particles.

3,598,998

SINGLE CRYSTAL INFRARED IMAGE CONVERTER

Allan G. Becker, Detroit, and Ojars Risgin, Grass Lake, both of, Mich.

Filed Sept. 24, 1968, Ser. No. 761,996
Int. Cl. G01n *21/00*
U.S. Cl. 250—83.3 HP **6 Claims**



This invention relates to a device for converting infrared radiation into visible light in order to make infrared images visible for viewing, detecting, and/or recording. In the converter, a single crystal of zinc sulfide is irradiated by a source

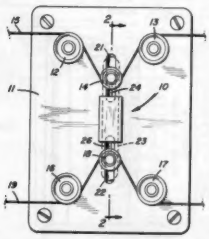
of ultraviolet light thereby trapping charge carriers in the crystal at impurity or defect sites in the crystal lattice. The crystal is then exposed to a desired scene of infrared radiation that frees the charge carriers and, through quantum transitions, emits photons thereby producing a visible image of the desired scene. A cryogenic device and optical system are employed to reduce ambient infrared radiation and to increase the converter's sensitivity to radiation of 15 microns and longer.

3,598,999

PROPORTIONAL TRIM CONTROL SYSTEM FOR AIRCRAFT

Laurence C. Hofmeister, Fort Lauderdale, Fla., assignor to The Bendix Corporation

Filed Feb. 17, 1969, Ser. No. 799,774
Int. Cl. G01j *1/36*
U.S. Cl. 250—204 **11 Claims**



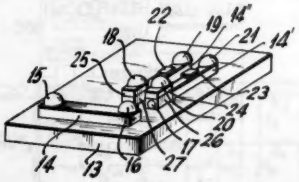
A proportional trim sensor for in-flight aircraft is disclosed. The system operates off a differential which exists in the tension of control cables when a correction is required. A sensor yields an output which is indicative of the magnitude and direction of tension difference. A utilization circuit receives the output and corrects the aircraft attitude to equalize the tension.

3,599,000

SEMICONDUCTOR OPTOELECTRONIC LOGIC ELEMENT UTILIZING THE GUNN EFFECT

Hisayoshi Yanai; Takayuki Sugeta; Masatoshi Migitaka; Hisao Nakashima; Yasuo Matsukura, and Kuniichi Ohta, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan and Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,927
Claims priority, application Japan, Mar. 15, 1968, 17198/68
Int. Cl. H01j *31/50, 39/12;* **H03k** *19/08*
U.S. Cl. 250—211 R **6 Claims**



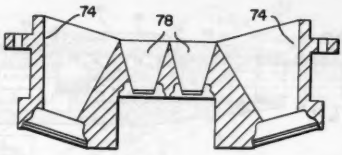
A semiconductor device for use as a logic element wherein a Gunn effect element is placed in optical coupling relationship with a plurality of semiconductive light emissive elements on a common semiconductor substrate. The Gunn effect element exhibits a photoconduction effect when irradiated by the light from the light emissive elements to provide AND or OR logic function depending upon the intensity of the irradiating light.

3,599,001

MULTIFIELD SENSOR ARRANGEMENT

Jerry A. Rolnik, Los Angeles; Frank P. Ballantyne, Santa Monica, and Robert H. Frels, Hawthorne, all of, Calif., assignors to Hughes Aircraft Comapny, Culver City, Calif.

Filed May 22, 1967, Ser. No. 640,233
Int. Cl. G02b *5/14*
U.S. Cl. 250—220 **2 Claims**



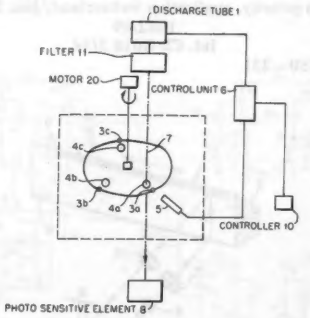
The structure disclosed comprises a detector package to accomplish signatured radiation detection over a determined field of view without the complex scanning devices associated with prior art systems. The package comprises a central group of tracking detectors peripherally surrounded by a plurality of acquisition detectors arranged in close juxtaposition and electrical isolation from each other. The detectors may be mounted in association with a funnel structure to ensure radiation impingement on the detectors as well as elimination of detector edge distortion.

3,599,002

METHOD AND APPARATUS FOR CENTRIFUGING WHICH UTILIZE A SYNCHRONIZED FLASH TUBE AS THE LIGHT SOURCE

Hans Beutelspacher, Braunschweig, and Wilhelm Horst Stegemann, Braunschweig-Stockheim, both of, Germany, assignors to Heraeus-Christ G.m.b.H., Osterode Harz, Germany

Filed Aug. 20, 1969, Ser. No. 851,555
Claims priority, application Germany, Aug. 22, 1968, P 17 98 101.0
Int. Cl. G02f *1/28;* **G01n** *1/00, 21/06*
U.S. Cl. 250—217 **14 Claims**



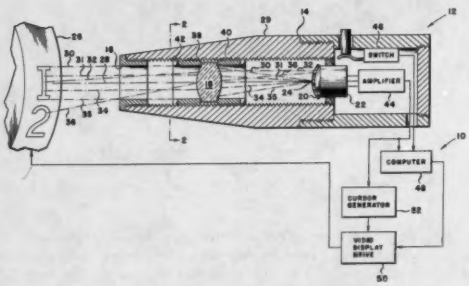
Centrifuging apparatus having a light source shining through the samples being centrifuged is modified by providing a flash tube which flashes in synchronism with passage of the sample over a photoelectric pickup. The flash tube is controlled from a capacitive transducer, so that optical and inductive errors are avoided. More than one flash tube may be used, each flashed for a specific sample, and supplied with monochromators adjusted for maximum, or minimum absorption wave length.

3,599,003

COLLIMATED FIELD OF VIEW LIGHT PEN

Donald E. Price, Mountain View; Joseph Kriensky, Sunnyvale, and Carl J. Lamberson, Cupertino, all of, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed July 14, 1969, Ser. No. 841,388
Int. Cl. G06k 9/00
U.S. Cl. 250—219 CR 5 Claims



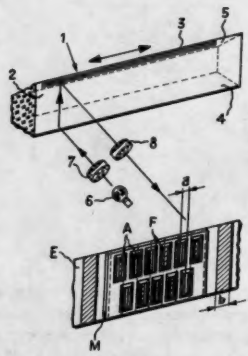
A light pen in a visual display information system is disclosed. The light pen has a fully collimated field of view and is responsive only to visual information within a constant area on a visual display screen, independent of the distance of the light pen from the display screen. The light pen includes a first aperture with an area equal to the desired field of view on the display screen, and a lens which focuses light rays entering the first aperture parallel to the lens axis at a pinhole light filter. The focused light passes through the pinhole to a photoelectric detector. The pinhole is at the focal point of the lens to accept only light rays parallel to the lens axis.

3,599,004

ARRANGEMENT OF PHOTOCELLS FOR THE DETERMINATION OF THE POSITION OF AN EQUIDISTANTLY DIVIDED SCALE

Georg Grendelmeier, Mutschellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Jan. 22, 1970, Ser. No. 4,958
Claims priority, application Switzerland, Jan. 24, 1969, 1052/69
Int. Cl. G01d 5/34
U.S. Cl. 250—231 6 Claims



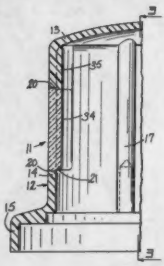
Arrangement of photocells for the determination of the position of a scale which is divided equidistantly with respect to the photocell arrangement having a plurality of photocells equally spaced in relation to one another located in the longitudinal direction of the scale. A differential transmitter is provided for evaluating the signals produced by the photocells during the movement of the scale. The distance between two adjacent photocells being one-tenth larger or smaller than a graduation of the scale. The photocells are combined into 10 photocell pairs by connecting each photocell, together with the preceding one to a first differential transmitter and together with the following photocell, to a second differential transmitter. A mask with recesses is located in front of the photocells and the recesses are smaller in width than a graduation of the scale. Differential transmitters are connected with adjacent photocells.

3,599,005

COVER HAVING A THICK WINDOW FOR PHOTOELECTRIC UNIT

Alvah A. Russell, Jr., Glastonbury, Conn., assignor to Ripley Company, Inc., Middletwon, Conn.

Filed May 7, 1969, Ser. No. 822,596
Int. Cl. G02b 5/00, 7/00; H01i 5/02
U.S. Cl. 250—239 10 Claims



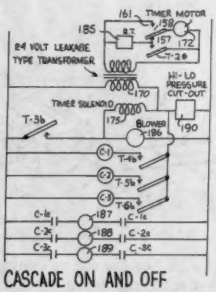
A cover for a photoelectric unit which is placed over the unit to allow light to strike the photoelectric unit from a single direction. The cover comprises a transparent window having a plurality of tapered extensions at its edges, the extensions emanating from a portion of the thickness of the windowpane. An opaque body member is molded about the window so that portions of the body member cover both sides of the tapered extensions on the windowpane. The thickness of the walls of the body member is substantially less than that of the windowpane.

3,599,006

CONDITION CONTROL DEVICE AND SYSTEM

John L. Harris, Dalafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Aug. 14, 1969, Ser. No. 850,012
Int. Cl. G05g 21/00; H01k 43/12
U.S. Cl. 307—39 35 Claims



A number of compressor motors or electric beaters are turned on and off in sequence to avoid line surges. Each load

switch consists of two flexible blades raised by a cam with the contacts separated. A latch serves to hold one blade up when the blades are lowered by the cam, causing contact engagement. A solenoid releases the latches of all the switches to open them simultaneously in response to a thermostat becoming satisfied or indicating an unfavorable condition.

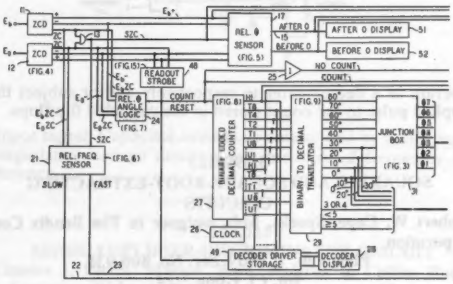
Special circuitry protects against compressor short cycling when the control is applied to refrigeration.

3,599,007

DIGITAL SYNCHRONIZER CHECK AND SYNCHROSCOPE

William H. Martin, Jr., Morristown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 29, 1969, Ser. No. 888,540
Int. Cl. H02j *3/42*
U.S. Cl. 307—87 **8 Claims**



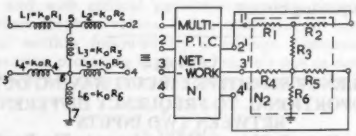
Logic circuits detect the polarities and zero crossings of the two AC sources to be paralleled. From this information, the relative frequency and relative phase angle are measured. Additional logic circuits allow paralleling signals to be passed during frequency and phase combinations that anticipate synchronism by the paralleling circuit closing time, provide the oncoming source has a slightly higher frequency than the bus, and provision is made for varying the anticipated closing time. The phase angle passband is automatically adjusted as the relative frequency changes to optimize the checking function, and provision is made to restrict manual paralleling to a narrower band. In addition, digital readouts driven by the relative phase measuring logic circuit provide a synchroscope at little added cost.

3,599,008

ELECTRICAL CIRCUITS FOR SIMULATING INDUCTOR NETWORKS

Jerzy Gorski-Popiel, Sutton, England, assignor to Associated Electrical Industries Limited, London, England

Filed July 9, 1968, Ser. No. 743,397
Claims priority, application England, July 10, 1967, Sept. 22, 1967, Sept. 28, 1967, 31,663/67;43,185/67;44,145/67
Int. Cl. H01l ; H01p *1/24*
U.S. Cl. 307—200 **1 Claim**



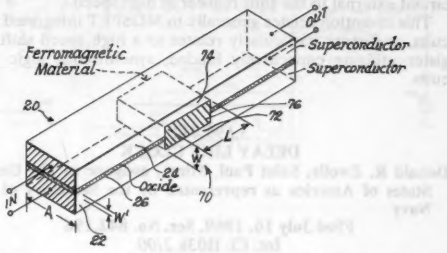
An electric circuit, for example an active filter circuit, in which inductors are simulated by means of positive immitance converter circuits terminated by resistors. One positive immittance converter circuit is provided for each external ungrounded node of the inductor network, and the terminating resistors are arranged to have the same topology as the inductor network.

3,599,009

NEURISTOR TRANSMISSION LINE, LEARNING JUNCTION, AND ARTIFICIAL NEURON

Robert D. Parmentier, Brooklyn, and Alwyn C. Scott, Madison, both of, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed July 19, 1968, Ser. No. 746,087
Int. Cl. H03k *17/30, 17/80*
U.S. Cl. 307—201 **8 Claims**



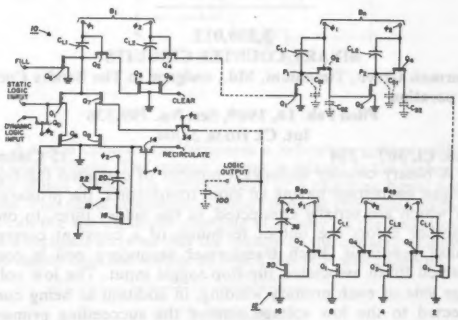
A neuristor transmission line capable of propagating a pulse without substantial attenuation, comprising a pair of elongated closely spaced line conductors made of different superconductive materials, and a thin layer of insulating material disposed between said line conductors, said layer being sufficiently thin to be readily penetrable by tunneling electrons. A learning junction adapted to be connected between neuristor transmission lines, and comprising a pair of superconductive elements, and an intermediate element of saturable ferromagnetic material disposed between said superconductive elements. An array of artificial neurons, comprising a plurality of neuristor transmission lines as described above, and a plurality of learning junctions connected between at least some of said neuristor transmission lines.

3,599,010

HIGH SPEED, LOW POWER, DYNAMIC SHIFT REGISTER WITH SYNCHRONOUS LOGIC GATES

Robert H. Crawford, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Continuation-in-part of application Ser. No. 636,998, Nov. 13, 1967, now abandoned. This application Nov. 13, 1967, Ser. No. 685,238
Int. Cl. H03k *21/00*; G11c *19/00*
U.S. Cl. 307—221 **6 Claims**



A shift register having a plurality of bits each formed by a pair of serially interconnected synchronous inverter stages operated by nonconcurrent clock pulses. Each inverter has an MOS transistor driver, a capacitive load, and a bilateral MOS transistor output. The shift register is in integrated circuit form on the (110) crystallographic plane with the current flow in all transistors in a direction normal to the (110) crystallographic plane. The logic input is the gate of the MOS

transistor driver. The clock pulses are sequentially applied to the two inverter stages so that the logic number is shifted through the bit in two steps. Each clock pulse is applied across the load and driver and also is applied to the gate of the output transistor of the respective stage. "Fill," "Clear," and "Recirculate" modes are provided by NAND and NOR logic gates formed in the first bit by connecting two or more MOS transistor drivers for the inverter stages in series or in parallel, respectively. The last stage of the last bit is a unique high speed DC buffer capable of driving a highly capacitive circuit external to the shift register at high speed.

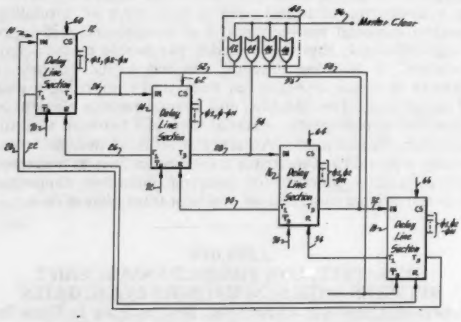
This invention relates generally to MOSFET integrated circuits, and more particularly relates to a high speed shift register utilizing capacitively loaded, synchronous logic circuits.

3,599,011

DELAY LINE CLOCK

Donald R. Zwolle, Saint Paul, Minn., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 16, 1969, Ser. No. 842,196
Int. Cl. H03k *2/00*
U.S. Cl. 307—223 **6 Claims**



A delay line clock having a plurality of interconnected delay line sections including control logic means whereby the sections can be operated sequentially with or without stops therebetween, and can be individually cycled. Special OR circuitry is used to limit the load of a plurality of taps from which clock phase outputs are derived.

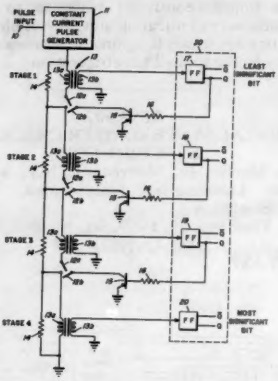
3,599,012

BINARY COUNTER CIRCUITS

Norman Green, Timonium, Md., assignor to The Bendix Corporation

Filed Feb. 14, 1969, Ser. No. 799,336
Int. Cl. H03k *23/04*
U.S. Cl. 307—224 **15 Claims**

A binary counter includes a number of cascaded flip-flop stages, each stage having an input transformer, the primaries of which are serially connected, in the ladder form, to one another across the output terminals of a constant current pulse generator. Each transformer secondary coil is connected to an associated flip-flop toggle input. The low voltage side of each primary winding, in addition to being connected to the low voltage side of the succeeding primary winding, is also connected to the low voltage side of the constant current pulse generator through a stage associated switching transistor. The transistor is biased on or off by the signal appearing on one of output terminals of the transistor's associated flip-flop. Thus, an input pulse from the constant current pulse generator, will be applied to the primary winding ladder down to the stage whose associated transistor is biased on, at which point the pulse is returned to the pulse source. If the switching transistors are turned on by a logical "0" in their associated flip-flops the circuit will operate as an incrementer, while a circuit whose switching transistors are turned on by a logical "1" in their associated flip-flops will



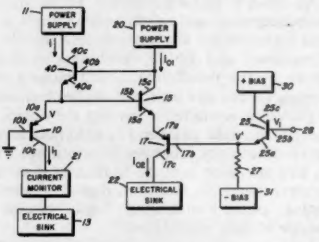
operate as a decrementer to respectively add or subject the applied pulse to the count stored in the cascaded flip-flops.

3,599,013

SQUARING AND SQUARE-ROOT-EXTRACTING CIRCUITS

Robert W. Cope, Sparks, Md., assignor to The Bendix Corporation

Filed Feb. 7, 1969, Ser. No. 800,035
Int. Cl. G06g *7/24*
U.S. Cl. 307—229 **13 Claims**



Squaring and square-root-extracting circuits are described which use transistors as the active elements. In the square-root-extracting circuit, input current through a first transistor establishes emitter to base voltage drop which is impressed along with a fixed voltage across the base electrodes of two oppositely poled second and third transistors serially connected emitter to emitter through which an output current flows. For this circuit, output current is the square root of input current. When used as a squaring circuit, input current is injected through the second and third transistors and output current is taken from the first transistor. A fourth transistor is provided to allow input current to be injected into the squaring circuit.

3,599,014

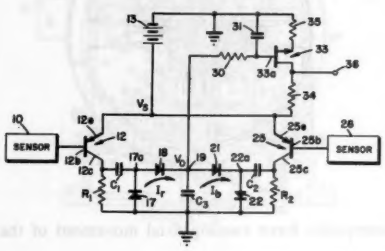
FREQUENCY-SENSITIVE CIRCUIT HAVING OUTPUT PROPORTIONAL TO FREQUENCY DIFFERENCE BETWEEN TWO INPUTS

Ralph W. Carp, Baltimore, Md., assignor to The Bendix Corporation

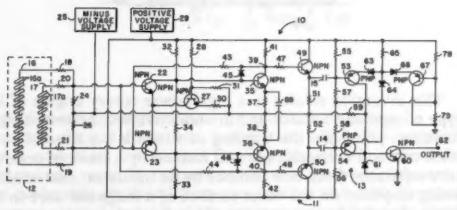
Filed Apr. 30, 1969, Ser. No. 821,555
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **15 Claims**

A slip computer for generating a DC voltage output signal proportional to the difference in frequency of two input frequency signals which utilizes a differentially charged capacitor, charged by a charging current whose average

value is correlated to the frequency of one frequency input signal and discharged by a discharging current whose average value is correlated to the frequency of the other frequency input signal. Capacitor voltage as determined by a high input impedance voltage detector is a measure of frequency difference.



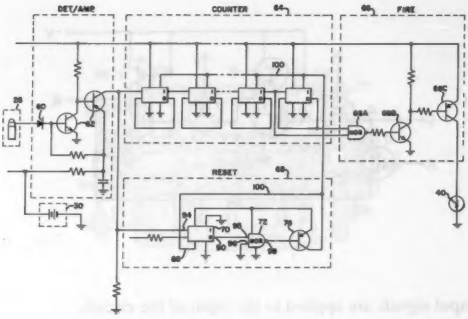
3,599,015
SENSE AMPLIFIER-DISCRIMINATOR CIRCUIT
Charles J. Ulrick, Marion, Iowa, assignor to Collins Radio Company, Richardson, Tex.
Filed Sept. 22, 1969, Ser. No. 859,721
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **1 Claim**



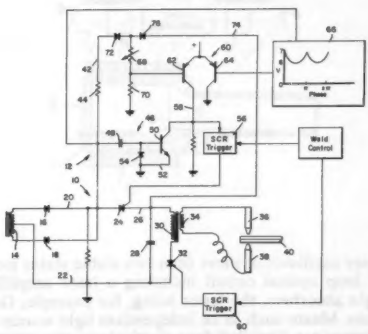
A sense amplifier/discriminator circuit, capable, for example, of performing with a 1-microsecond memory, that is very stable, extremely wide band, displays a very narrow "gray band," and with critical parameters set by resistor ratios rather than absolute values. It has a differential operational amplifier section followed by a voltage comparator and switch section providing logic level signals out as determined by amplitude of signal input from memory sense lines.

3,599,016
AUTOMATIC RESET CIRCUIT
Robert A. Leightner, Burlington, Vt., assignor to General Electric Company
Filed July 22, 1969, Ser. No. 843,625
Int. Cl. H03k *17/00, 5/20*
U.S. Cl. 307—247 **4 Claims**

A reset circuit, for a logic circuit which processes pulses of at least a given time width, comprises a race loop circuit including a flip-flop, a gate having an input-to-output transfer delay greater than said given time width, and a driver or gate having an input-to-output transfer delay less than said given time width.



3,599,017
CAPACITOR CHARGE CIRCUIT
Malcolm M. Oakes, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Apr. 28, 1969, Ser. No. 819,831
Int. Cl. H03k *17/00, 1/00*
U.S. Cl. 307—252 J **7 Claims**

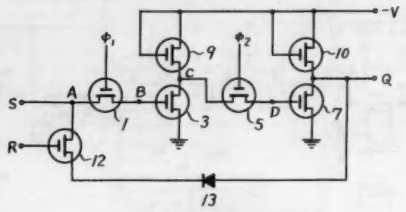


A signal comparator compares a reference voltage with a related voltage. The related voltage is related to the higher of the actual voltage on the capacitor or a charging signal voltage. The signal comparator output signal is controlled so that it can fire the capacitor charging SCR only on the downslope of a rectified wave so that the voltage to the capacitor can be no higher than the voltage at which the SCR was triggered.

3,599,018
FET FLIP-FLOP CIRCUIT WITH DIODE FEEDBACK PATH
Isamu Washizuka, Osaka; Satoshi Teramura, Nara-shi, and Hitoshi Hanahara, Yamatokoriyama-shi, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 15, 1969, Ser. No. 791,367
Claims priority, application Japan, Jan. 25, 1968, 43/4661
Int. Cl. H03k *3/286*
U.S. Cl. 307—279 **2 Claims**

A flip-flop circuit particularly useful in connection with in-

tegrated circuitry and embodying a feedback path which functions to stabilize the output when both set and reset input signals are applied to the input of the circuit.

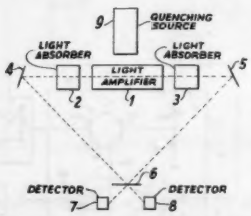


3,599,019

LASER DEVICE WITH SELECTIVE OSCILLATION

Yasuo Nannichi, and Susumu Ito, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

Filed Aug. 7, 1968, Ser. No. 750,793
Claims priority, application Japan, Aug. 25, 1967, 42/55083
Int. Cl. H01s 3/10
U.S. Cl. 307—312 8 Claims



A laser oscillator of more than two stable states includes a closed loop optical circuit including a laser amplifier, and two light absorbers, the latter being, for example, GaAs PN junctions. Means such as an independent light source or voltage triggers are provided for selectively emphasizing a light beam of at least one specific propagation direction, thereby reducing the absorption coefficient and generating a stable oscillation state in that propagation direction.

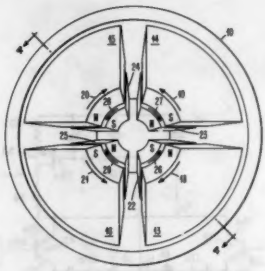
3,599,020

LINEAR ACTUATOR WITH ALTERNATING MAGNETIC POLES

John P. Harris, Boulder, Colo.; Paul Y. Hu, Boulder, Colo., and Ernest G. Newman, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1970, Ser. No. 15,105
Int. Cl. H02k 41/02
U.S. Cl. 310—13 11 Claims

A linear actuator having an axially movable tubular armature which is encircled by a first even numbered group of alternate magnetic poles and by a second even numbered but axially displaced group of alternate magnetic poles; the second group of poles alternate with each other and with the poles of the first group. The armature carries conductor segments adjacent to each of the poles. These conductor segments extend normal to the axial direction of armature movement. Current supply means is effective to cause currents to flow in the proper direction in each of the conductor segments such that the conductor segments jointly contribute to a composite force causing axial movement of the armature.

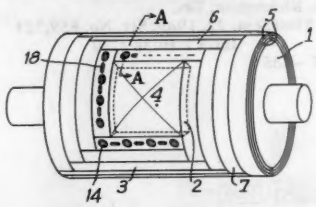


3,599,021

ROTOR COOLING CONFIGURATION FOR DYNAMOELECTRIC MACHINES

Jean Guimbal, 52, Rue Henri Dechaud, 42 Saint-Etienne, (Loire), France

Filed Nov. 17, 1969, Ser. No. 877,214
Claims priority, application France, Nov. 25, 1968, 238
Int. Cl. H02k 1/32
U.S. Cl. 310—61 9 Claims



This invention relates to a high power rotary engine of the type comprising a stator and an inductive rotor comprising at least two poles and the winding of which is constituted by at least one coil for each pole and formed by a stack of conductors separated from one another by an insulator, said winding being disposed on the outer surface of a magnetic core in the form of a drum concentric to the axis of the rotor, comprising a cooling circuit constituted by grooves or slits made in or between the conductors of the rotor and fed with coolant fluid through a fluid inlet channel, wherein each conductor of the rotor is a flat, conductive and electrically continuous band, on the one hand wound around a salient pole on the cylinder of a winding, the different layers of superposed conductors constituting concentric cylinders and, on the other hand, fixed to the drum by bolts which are radial or slightly inclined with respect to said magnetic drum, and in that the slits for the passage of the coolant fluid are made transversely with respect to the length of the conductor.

3,599,022

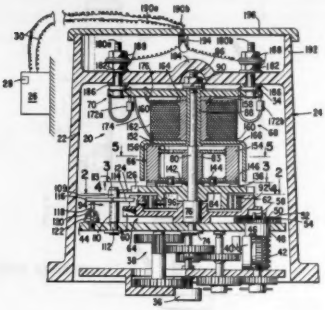
IMPULSE GENERATOR FOR METERS

John D. Adair, Huntington Valley, Pa., assignor to The Singer Company, New York, N.Y.

Filed July 7, 1970, Ser. No. 52,876
Int. Cl. H02k 7/10
U.S. Cl. 310—75 A 8 Claims

An impulse generator powered by a meter to generate an AC voltage which is rectified to a DC pulse. Each DC pulse corresponds to a predetermined quantity of fluid medium flowing through the meter. The DC pulse is transmitted to a

remote counter located for easy access to permit convenient reading of the register thereof. The impulse generator is compact so as to fit within the housing of a conventional meter or a modified housing of a previously installed meter.



3,599,023

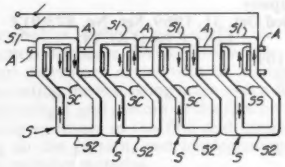
SINGLE PHASE INDUCTION MOTORS

Gerald W. Bottrell, 4321 Rosemont Ave., Montrose, Calif.

Filed Nov. 17, 1969, Ser. No. 877,131

Int. Cl. H02k *17/00*

U.S. Cl. 310—166 **18 Claims**



Self-starting, single-phased induction motors can be constructed using a rotor and a stator in which the magnetic poles caused by the current flowing through the coils of the stator and caused by induced currents in the bars of the rotor are preferably displaced from one another about 90 electrical degrees around the axis of the rotor at one of the ends of the motor, while they are positioned opposite one another in a conventional manner at the other end of the motor. In a motor of this invention, auxiliary windings are located at the first of these ends in the stator displaced from the stator winding. Preferably they are displaced an amount of about 90 electrical degrees.

3,599,024

COMB-SHAPED POLE-TYPE DYNAMOELECTRIC MACHINES

Hiroyuki Kitamura, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

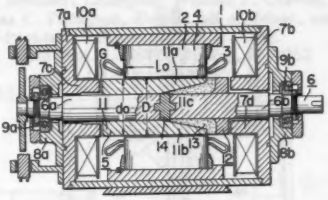
Filed Oct. 6, 1969, Ser. No. 864,069

Claims priority, application Japan, Oct. 8, 1968, 72848/68

Int. Cl. H02k *1/22*

U.S. Cl. 310—263 **3 Claims**

In a comb-shaped pole-type dynamoelectric machine wherein magnetic flux produced by field coils mounted on the inner sides of end field yokes is passed to the rotor through an airgap, an annular axial projection is formed on the inside of each field yoke to form an additional airgap between it and the end portion of the rotor so as to pass magnetic flux to the rotor through said two airgaps in parallel whereby to utilize all cross-sectional area of the rotor thus reducing the diameter thereof.



3,599,025

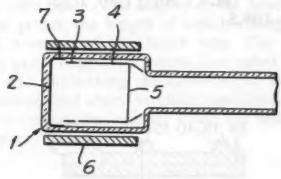
IMAGE ORTHICON WITH MAGNETIC FOCUS

Ljubov Dmitrievna Axenova, Prospekt Morisa Toreza, 38, Korpus 4, kv. 20, Leningrad, U.S.S.R.

Filed Aug. 14, 1968, Ser. No. 752,615

Int. Cl. H01j *31/28, 3/12*

U.S. Cl. 313—65 **2 Claims**



An image orthicon tube is provided with a photocathode and a target spaced therefrom. Interposed therebetween is an accelerating electrode and a further electrode interposed between the accelerating electrode and the photocathode. The accelerating electrode is supported opposite the photocathode by a distance equivalent to the longitudinal length of the further electrode. The further electrode is maintained at the same potential as that of the photocathode.

3,599,026

PROJECTION TUBE WITH ROTATABLE COOLED DISPLAY SCREEN

Asahide Tsuneta, Kawasaki-shi; Shinichi Sawagata, Tokyo, and Mikio Noguchi, Kawasaki-shi, all of, Japan, assignors to Tokyo Shibarua Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 25, 1969, Ser. No. 852,625

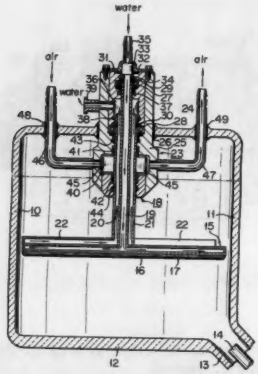
Claims priority, application Japan, Aug. 28, 1968, Aug. 31, 1968, Aug. 31, 1968, 43/61272; 43/62252; 43/75009

Int. Cl. H01j *29/02, 1/42, 21/22*

U.S. Cl. 313—92 **7 Claims**

A projection picture tube comprises a vacuum vessel, an anode support member received in said vessel, a fluorescent

film coated on the upper surface of said anode member and an electron gun assembly for ejecting electron beams on said



fluorescent film, said anode member consisting of a hollow metal body through which a cooling fluid is caused to flow.

3,599,027

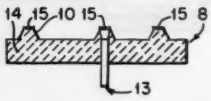
DISPLAY DISCHARGE TUBE HAVING IMPROVED DISPLAY SUBSTRATE AND METHOD OF MAKING SAME

Michio Koshizuka, and Shinetsu Sato, both of Tokyo, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan

Filed Feb. 24, 1970, Ser. No. 013,302

Int. Cl. H01j *1/30, 1/52*

U.S. Cl. 313—109.5 **9 Claims**



A display substrate includes a display plate having mutually separated, integral projecting symbol segments formed thereon by a press-forming technique. A metallic layer is provided on the raised surfaces of the segments to form the luminous cathodes representing the symbol segments. Electrical connection of the metallic layers to an energizing source is made by means of pins extending through the segments and the plate, the upper surfaces of the pins being in the same plane as the raised surface of its respective segment.

3,599,028

MERCURY VAPOR DISCHARGE LAMP EMPLOYING EUROPIUM ACTIVATED CALCIUM AND/OR STRONTIUM PYROPHOSPHATE LUMINESCENT MATERIAL

Willem Lambertus Wanmaker; Johannes Wilhelmus Ter Vrugt, and Johannus Godefridus Verlijsdonk, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1968, Ser. No. 708,836

Claims priority, application Netherlands, Mar. 1, 1967, 6,703,401

Int. Cl. H01j *1/63;* **C09k** *1/36*

U.S. Cl. 313—109 **3 Claims**

Mercury-vapor discharge lamp employing as a luminescent material a bivalent europium activated pyrophosphate of calcium or strontium and combinations thereof.

3,599,029

FLUORESCENT LAMP ENVELOPE WITH TRANSPARENT PROTECTIVE COATING

William C. Martyny, Lyndhurst, Ohio, assignor to General Electric Company

Filed Oct. 31, 1969, Ser. No. 873,012

Int. Cl. H01j *61/35*

U.S. Cl. 313—109 **6 Claims**

A fluorescent lamp having on the inner surface of its envelope a transparent protective coating consisting of a layer of titanium dioxide adherent to the glass and a layer of aluminum oxide thereover. The coating is prepared by flushing through the glass envelope or tube a mixture comprising a solution of tetrabutyl titanate in a thinner and a dispersion of aluminum oxide in an organic binder, and then drying. The phosphor coating is applied over the protective coating in conventional manner using a water soluble binder system and other manufacturing steps are unchanged. Advantages are higher lumens, improved maintenance particularly in highly loaded lamps, elimination of oxide rings, and avoidance of darkening where the phosphor coating is thin.

3,599,030

ANNULAR SURFACE GAP SPARK PLUG

Daniel A. Armstrong, Oakfield, Wis., assignor to Brunswick Corporation, Chicago, Ill.

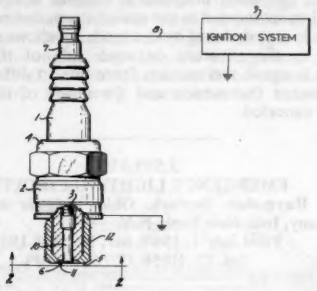
Filed July 15, 1969, Ser. No. 841,901

Int. Cl. H01t *13/02*

U.S. Cl. 313—131 R **1 Claim**

A tungsten alloy center electrode is employed in a spark

plug of the annular surface gap-type for use with a high tension ignition system.

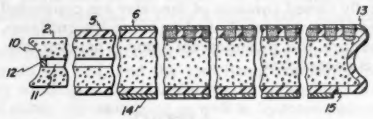


3,599,031

BONDED HEATER, CATHODE, CONTROL ELECTRODE STRUCTURE

James E. Beggs, Schenectady, N.Y., assignor to General Electric Company

Filed May 21, 1970, Ser. No. 39,463
Int. Cl. H01j *1/90, 19/44*
U.S. Cl. 313—268 5 Claims



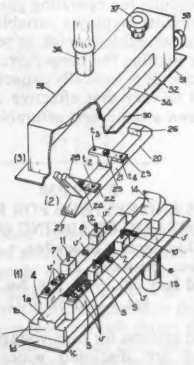
A unitary heater, cathode, and control electrode structure for an electron discharge device is formed by coating a disk of a porous refractory metal with an inorganic insulating layer, overcoating the insulating layer with a film of refractory metal, forming a grid pattern in the film on one side of the disk, forming openings in the film and insulating layer corresponding to the pattern, and impregnating the disk with thermionic emissive material.

3,599,032

CROSSED-FIELDS TRAVELING WAVE TUBES

Pierre Nicodeme; Walter Sobotka, and Roland Valat, all of Paris, France, assignors to Thomson-CSF

Filed July 2, 1969, Ser. No. 838,595
Claims priority, application France, July 16, 1968, 159,315
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 3 Claims



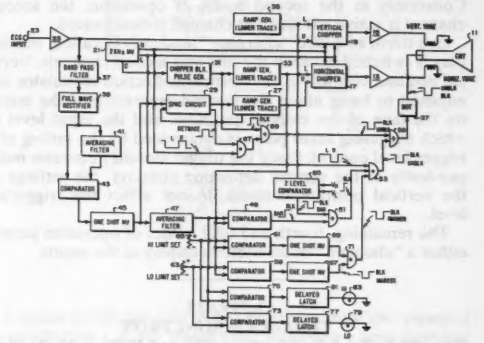
A crossed fields traveling wave tube wherein the pole pieces providing the magnetic field are mounted along the delay line, inside the tube, and magnetic windows are formed in the tube envelope for associating the pole pieces with the magnetic circuit of the tube.

3,599,033

SYSTEM FOR SIMULTANEOUS DISPLAY OF ECG AND HEART RATE

Robert L. Stettiner, Lexington; William F. Craven, Sudbury, and Dana C. Finlayson, Everett, all of, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 22, 1969, Ser. No. 859,962
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 8 Claims



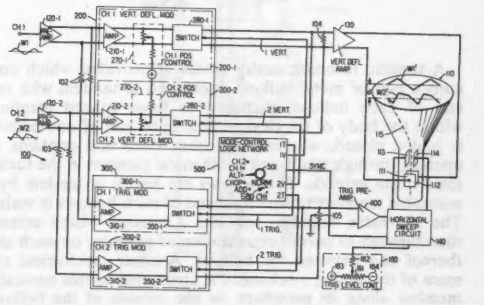
A cathode ray tube system receives a cardiac signal and simultaneously produces two displays corresponding to the analog form of the cardiac signal and the heartbeat rate. The displays are generated by separate horizontal and vertical deflection circuits which are alternately switched to drive the cathode ray tube beam. The display of the heart rate is a picture of a bar graph, the length of which changes to indicate the moving average of the heart rate. The bar graph is produced by generating a horizontal line raster and selectively blanking and unblanking the cathode ray tube. High and low limit markers and alarm circuitry associated with the bar graph display operate to indicate when the heart rate moves outside a preset range.

3,599,034

CONTROLLED DISPLAY OF WAVEFORMS

Walter A. Fischer, Jr., Dover; Robert Coultas, Madison, and Arthur Nichols, Cedar Grove, all of, N.J., assignors to Dumont Oscilloscope Laboratories, Inc., West Caldwell, N.J.

Filed Apr. 25, 1969, Ser. No. 819,239
Int. Cl. H01j *29/74*
U.S. Cl. 315—26 13 Claims



A system for the display of waveforms in which vertical deflection signals derived from one or more inputs are ap-

plied to a cathode-ray tube through a switchable, vertical deflection modulator; and trigger signals, also originating with respect to the inputs, act upon a horizontal deflection circuit of the cathode-ray tube through a switchable trigger modulator.

For each input there is a signaling channel that includes a constituent of the vertical deflection modulator and an associated constituted of the trigger modulator. The switching of the modulator constituents is governed by the settings of a mode-control logic network to determine the way in which the inputs are displayed by the cathode-ray tube, as well as the origin of the trigger signals that are used in synchronizing the horizontal deflection circuit.

As disclosed, there are two distinctive input channels and five modes of operation. For operation in the first mode, the first channel is active, and the second channel is deactivated. Conversely in the second mode of operation, the second channel is active and the first channel is deactivated.

In a third, so-called "alternate" mode of operation, the display is switched between the first and second channels. Vertical position controls in the vertical deflection modulator are adjusted to bring about the desired separation of the traces on the face of the cathode-ray tube, and the input level at which triggering takes place is determined by the setting of a trigger level control. Since the trigger circuitry operates independently of the vertical deflection circuitry, the settings of the vertical position controls do not affect the triggering level.

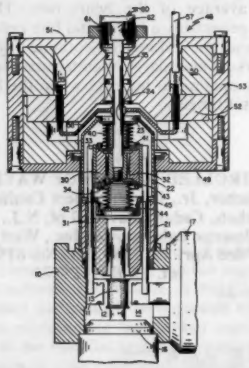
The remaining, fourth and fifth modes of operation permit either a "chopped" or an additive display of the inputs.

3,599,035

TUNABLE MAGNETRON

Kenneth E. Frerichs, Montoursville, and William H. Perkins, Williamsport, both of, Pa., assignors to Litton Industries, Inc., Beverly Hills, Calif.

Filed Sept. 29, 1964, Ser. No. 400,002
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.59 **16 Claims**



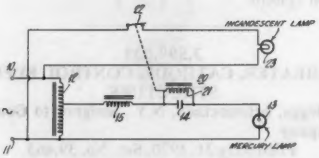
A tunable resonant cavity device is provided which contains a pair of metal bellows connected in tandem with one end of each bellows anchored to fixed spaced locations within the body of the device. One fixed end of one bellows is sealed closed, whereas the other fixed end contains an opening through which one mechanical element in the tuning mechanism extends. The bellows are joined in tandem by a moveable member to which an end of each bellows is sealed. The moveable member contains a passage which extends therethrough to permit equalization of pressure on each side thereof and between the bellows. Another mechanical element of the tuning mechanism is connected to this moveable member along its periphery on the outside of the bellows. The mechanical movement of an external tuner mechanism is transmitted through a coupling to one of the aforementioned tuning elements, the tandem bellows to the other mechanical element and in so doing causes one of the bellows to be compressed and the other to expand although the total volume enclosed by the tandem connected bellows is substantially constant. The other mechanical element is coupled to the tuning element located in the sealed evacuated resonant cavity which is sealed closed by the tandem bellows structure. Inasmuch as the pressure on each side of the moveable member is equal, the vacuum force due to differential pressure between the outside and the inside of the evacuated cavity is canceled.

3,599,036

EMERGENCY LIGHTING CIRCUIT

Jack E. Haymaker, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.

Filed July 1, 1969, Ser. No. 838,185
Int. Cl. H05b *39/10, 41/46*
U.S. Cl. 315—93 **7 Claims**



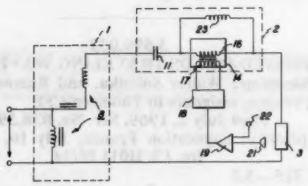
In an emergency lighting circuit, a relay is provided with its coil in parallel with a capacitor in the mercury lamp circuit. Normally closed contacts of the relay are connected in series between a power supply and an incandescent lamp, in order to energize the incandescent lamp whenever the mercury lamp is deenergized.

3,599,037

GASLAMP LEAD BALLAST CIRCUIT HAVING FEEDBACK CONTROL

Robert E. Grace, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed May 1, 1969, Ser. No. 820,757
Int. Cl. H05b *41/391*; **G01j** *1/32*
U.S. Cl. 315—151 **2 Claims**



Lead ballast circuits for operating gas discharge lamps are disclosed. The circuits employ a variable inductor, such as a linear inductor or saturable reactor, in series with a capacitor as the means for limiting the lamp current. The effective impedance of the circuit is basically capacitive and the variable inductor is used to vary that effective capacitance. A feedback path between a lamp and saturable reactor is also disclosed.

3,599,038

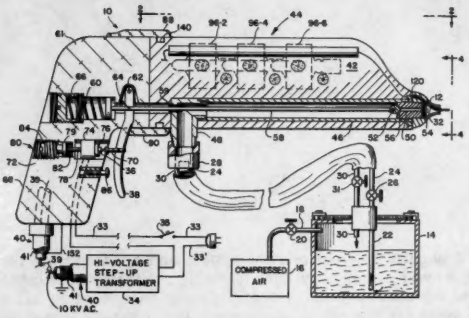
APPARATUS AND SYSTEMS FOR HIGH-VOLTAGE ELECTROSTATIC CHARGING OF PARTICLES

Donald D. Skidmore, Brookline, N.H., assignor to Hipotronics, Inc., Brewster, N.Y.

Filed July 28, 1969, Ser. No. 845,267
Int. Cl. B05b *5/02*
U.S. Cl. 317—3 **12 Claims**

Apparatus and systems for high-voltage electrostatic charging of particles are disclosed which are compact and lightweight so as to be truly portable. High-voltage electrostatic particle charging tools are disclosed for performing the useful function of propelling charged particles toward a

desired object incorporating a high-voltage supply as part of the handling tool, the illustrative high-voltage supplies being voltage multiplier rectifier networks. The voltage multiplier sections are stacked within the barrel structure of the handling tool to provide progressively higher voltages toward the muzzle end thus minimizing electrical leakage and reducing hazard. A pair of parallel-spaced stacks of capacitors with diode rectifiers selectively interconnected between the



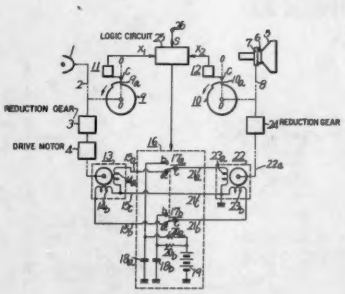
respective capacitors of the stacks are encapsulated within solid insulating material to form a rigid barrel structure. A portable setup transformer is positioned emote from the tool the transformer being adapted to be worn by the user, as by mounting on his belt, and the tool being connected to the secondary winding of the transformer by a flexible insulated electrical cable. Air-atomizing as well as hydraulic-atomizing systems may be employed with the invention.

3,599,039

PHASE-SYNCHRONIZED ROTATING SYSTEM

Takeo Miyashita, Saitama-ken, and Kohshiro Ito, Tokyo, both of, Japan, assignors to Kabushikikaisha Tokyo Keiki Seizosho (Tokyo Keiki Seizosho Co., Ltd.), Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,457
Claims priority, application Japan, Aug. 8, 1968, 43/55977
Int. Cl. H02p *3/24*
U.S. Cl. 317—6 **5 Claims**



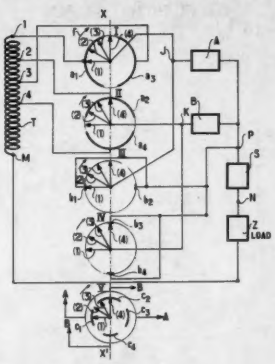
A phase-synchronized rotating system for driving and synchronizing a pair of shafts which includes detecting means producing output signals indicative of the positions of the shafts which supply inputs to a logic circuit that controls the coupling between a synchronous generator driven by the first shaft and a synchronous motor which drives the second shaft. The logic circuit controls switches such that when the shaft positions coincide with each other dynamic braking is applied to the driven shaft and such that the synchronous generator drives a synchronous motor when the shaft positions do not coincide.

3,599,040

ON-LOAD ELECTRONIC CONTROL SYNCHRONOUS SWITCHING DEVICE

Gerard Ebersohl, Aix-Les-Bains, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Nov. 5, 1969, Ser. No. 874,182
Claims priority, application France, Nov. 5, 1968, 172630
Int. Cl. H02h *7/22*
U.S. Cl. 317—11 **16 Claims**



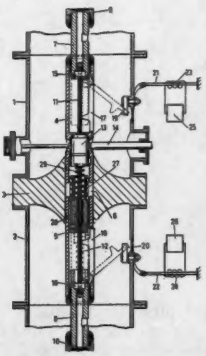
Logical circuit for controlling switching from one terminal to another on a power transformer supplying a very distorted current and comprising a mechanical preselector and two solid-state switches, whose effect is to permit the shutting off of a first switch (A) and the priming of a second switch (B) only if the operation can be effected without danger to the equipment, depending on the form of the current during the operation.

3,599,041

ISOLATOR SWITCHES PROVIDED WITH GROUNDING SWITCH BLADES AND GROUND RESPONSIVE SIGNALLING AND PROTECTIVE MEANS

Rintje Harmelen Boersma, and Gijsbert W. Irik, both of Bilthoven, Netherlands, assignors to N.V. "COQ", Utrecht, Netherlands

Filed Oct. 20, 1969, Ser. No. 867,744
Claims priority, application Netherlands, Aug. 4, 1969, 69.11833
Int. Cl. H02h *3/16;* **H01h** *31/14*
U.S. Cl. 317—18 R **10 Claims**



A metal-clad isolator switch for multiple interruption divided in two parts insulated from each other and comprising means for connecting the interconnected movable switching contacts of the isolator switch with earth and a selectively

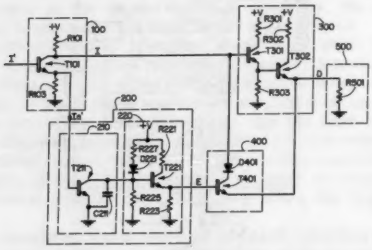
operating signalling and protecting system which selectively indicates, when and in which one of the isolator switch parts an unwanted earth-connection occurs.

3,599,042

OVERLOAD PROTECTION DEVICE FOR EMITTER-FOLLOWER LINE DRIVER

John R. Andrews, Jr., Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 31, 1969, Ser. No. 872,821
Int. Cl. H02h *3/08, 7/20*
U.S. Cl. 317—16 10 Claims



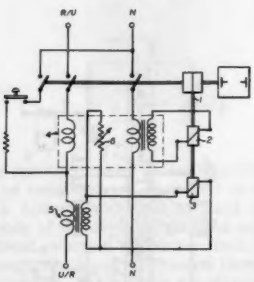
The invention provides a two-level control for protecting an emitter-follower driver from passing excessive current. The first level is that of enabling a protection circuit provided by the invention whenever the emitter-follower draws current in response to the "on" level of a logic input signal. The second state, or level, of protection occurs when a fault or overload condition occurs which causes the voltage level at the emitter to fall below a predetermined level which could sense an overload or fault condition. If this occurs, the protection circuit of the invention becomes operative and shunts all of the current away from the driver.

3,599,043

ELECTRICAL CIRCUIT BREAKERS

Siegfried Biedermann, Schellenberg, Liechtenstein, assignor to Unionorm Anstalt, Vaduz, Liechtenstein

Filed Dec. 18, 1968, Ser. No. 784,652
Claims priority, application Austria, Dec. 19, 1967, A 11483/67
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 2 Claims



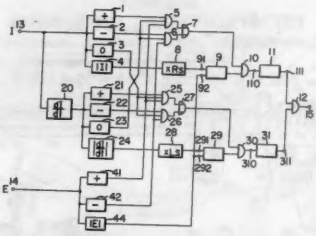
A fault current protection switch with additional excess current release, which comprises a first coil to be energized by a fault current and a second coil of a magnet release separated from the first coil, the second coil serves the release upon occurrence of excess current. A one-phase current changer constitutes the sole means for energizing the second coil, and includes a voltage coil connected with the second coil. A resistance has a positive resistance coefficient and is disposed parallel to the voltage coil.

3,599,044

SUPERHIGH-SPEED RELAYING SYSTEM AND APPARATUS FOR PROTECTION OF POWER SYSTEMS

Takeshi Takemura, and Kikuo Kawasaki, both of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed Apr. 30, 1970, Ser. No. 33,200
Int. Cl. H02h *3/00, 5/00*
U.S. Cl. 317—36 D 4 Claims



A superhigh-speed relaying system and apparatus for the protection of power systems featuring a directional distance relaying scheme, based essentially upon the simple equation representing the relationship among the voltage, current, resistance and inductance of a given power system:

$$L\frac{dI}{dt}+RI=E$$

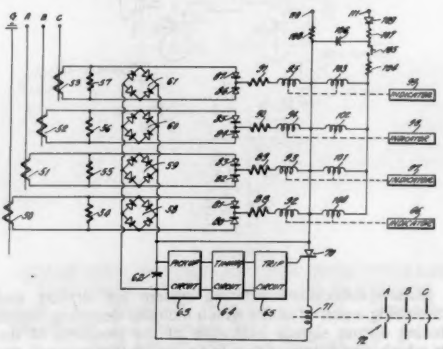
where E designates the voltage, I the current, R the resistance and L the inductance. This expression holds true when, in the event of the occurrence of a fault, the DC component is superposed upon the fault current. And, given the phase relationship between the voltage E and the current I, and the values for the inductance L and the resistance R, the direction of and the distance to the location of the fault are obtainable. Moreover, by the same expression, the inductance L is obtainable as a result of comparison made between the polarities and between the magnitudes of E and dI/dt when $I=O$, whereas the resistance R is obtainable from comparison made between the polarities and between the magnitudes of E and I when $dI/dt=O$.

3,599,045

DISCRIMINATING FAULT INDICATION CIRCUIT

Pedro Farinas, Cornwells Heights, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 3, 1969, Ser. No. 863,632
Int. Cl. H02h *3/08*; G08b *21/00*
U.S. Cl. 317—36 TD 8 Claims



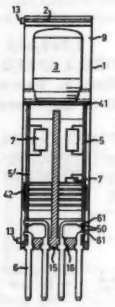
A mechanical indicator having a first and second indicating position determined by energization of a set coil or reset coil, respectively, is provided for each phase of a multiple phase power distribution system. Each of the phases is provided with a current-sensing circuit which delivers signals to the gate circuit of a controlled rectifier. The controlled rectifier is then fired in series with a trip coil which opens the

multiphase circuit responsive to a fault on any of the phases. The set coils of each of the indicators are energized responsive to a fault in one or more of the phases being monitored to indicate that the controlled rectifier has fired, and which phase conducted fault current.

ERRATUM

For Class 317—101 see:
Patent No. 3,599,234

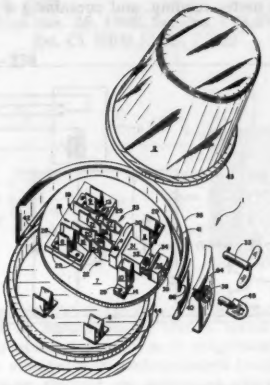
3,599,046
ASSEMBLY FOR ELECTRICAL NUMERICAL DISPLAY
Helmuth Spreitzer, Zurich, and Willi Hirt, Wallisellen, both of, Switzerland, assignors to Contraves AG, Zurich, Switzerland
Filed June 22, 1970, Ser. No. 48,182
Claims priority, application Switzerland, Feb. 11, 1970, 1938/70
Int. Cl. H02b *1/04*
U.S. Cl. 317—101 R **5 Claims**



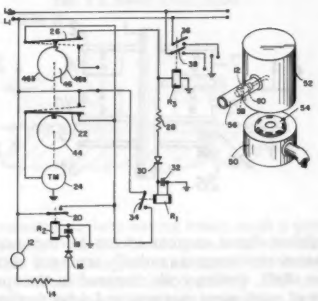
A component assembly for electrical numerical display comprising a respective U-shaped housing for each respective numerical display tube which is arranged behind a transparent cover disk. There is also provided at least one stationary circuit board having contact track means leading to contact terminals, the current-conducting track means being disposed in at least one plane of the circuit board and the contact terminals being situated along and in proximity to a housing wall at the opposite side of the cover disk and extending transverse to the plane of the circuit board. The U-shaped housings are constructed to be arranged in a row to form a module or assembly of such housings and for the application thereto of closure plates. These closure plates are equipped with protruding retaining spring means which in cooperation with flanged edge means of the housing and the closure plates permit the insertion and mechanical retention of the entire row of housings in a cutout or recess of the front plate of a suitable apparatus with which the assembly is used. Furthermore, a respective connection pin is mechanically and electrically coupled with the associated contact terminal of each current-conducting track, this connection pin extending transversely through the aforementioned housing wall and being mechanically retained thereat.

3,599,047
LOCKABLE SWITCH FOR POWER METERS
Harry Magarian, 19865 Burleigh Drive, Yorba Linda, Calif.
Filed Feb. 11, 1970, Ser. No. 10,955
Int. Cl. E05b *35/12*
U.S. Cl. 317—108 **10 Claims**

The switch is inserted into the socket on a facility to which power is being supplied. The prongs of the power meter are inserted into mating clamps of the switch. The assembly is secured together by a lockable metal band that encloses the switch and flanges on the socket and the meter. When it is desired to engage the switch so that power is connected through the meter into the facility, a key is inserted through an opening in the band and rotated to engage contacts of the switch. Thereafter, the key is removed and the band relocked so that power can only be disconnected by authorized personnel.



3,599,048
LIGHTING CONTROL SYSTEM
Frank M. Olin, R.R. #18, Box 361, Indianapolis, Ind.
Filed Apr. 23, 1970, Ser. No. 031,268
Int. Cl. H01j *39/12;* **H05b** *37/00;* **H01h** *47/24*
U.S. Cl. 317—124 **9 Claims**

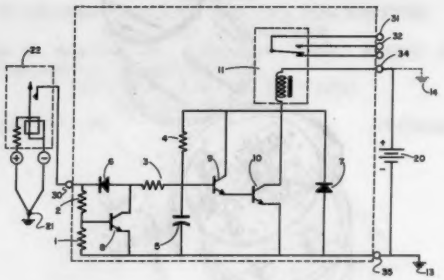


A control system comprising first circuit means including light-actuated means and first switch means cooperating to provide a first circuit condition in the presence of light and a second circuit condition in the absence of light, load switch means effective, when operated, to energize a load, second switch means connected in parallel with the said first switch means and effective, when operated, to bypass and disable the first switch means, and a timer. The timer, which may be a motor-driven, cam-operated timer, includes timer control switch means and load control switch means. The control system is arranged so that, once the timer is started by the first circuit means changing from its first circuit condition to its second circuit condition, the load is energized and the second switch means is operated to bypass the first switch means so that changes in the electrical condition of the light-actuated means have no effect on the system.

3,599,049
DUAL-POLARITY ELECTRONIC SWITCH
Robert A. Barnard, Vancouver, Wash., assignor to Syndyne Corporation, Vancouver, Wash.
Filed Apr. 30, 1969, Ser. No. 820,483
Int. Cl. H01h *47/26*
U.S. Cl. 317—133.5 **1 Claim**

An electronic switch responding to the closure of the contacts of a meter relay operated by a grounded junction ther-

mocouple, the switch containing a switching amplifier so that the device is actuated by a flow of current through the meter relay contacts which is too small to cause a noticeable change in the meter reading, and containing a dual-polarity

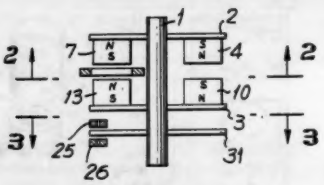


gate arranged so that the switch is operable if the thermocouple junction is grounded to the positive or to the negative side of the battery power source.

3,599,050
BRUSHLESS DIRECT CURRENT MOTOR

Chifumi Komatsu, Suwa-shi, Japan, assignor to Kabrishiki Kaisha Suwa Seikosha

Filed Apr. 29, 1969, Ser. No. 820,201
Claims priority, application Japan, Apr. 30, 1968, 43/28,686
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **4 Claims**

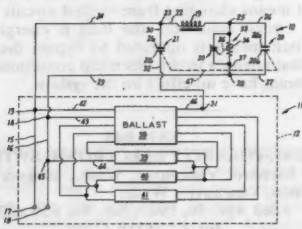


A brushless direct current motor having pairs of axially spaced permanent magnets radially arranged about and fixed to a rotor shaft, driving coils disposed in the space between said pairs of permanent magnets and detecting means including detecting coils.

3,599,051
TIME-DELAY CIRCUIT FOR ELECTRIC DISCHARGE DEVICES

Art Lee, Bloomington, Ill., assignor to General Electric Company

Filed Apr. 13, 1970, Ser. No. 27,620
Int. Cl. H01h *47/18*
U.S. Cl. 317—141 **4 Claims**

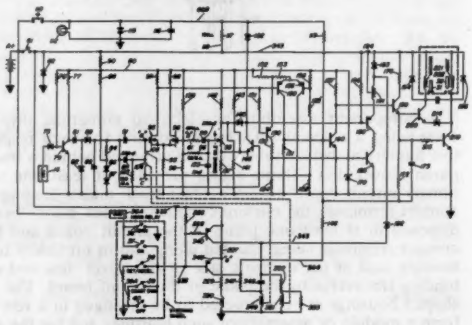


A time-delay circuit, preferably for use for delaying application of full voltage to an electric discharge device, including a pair of spaced terminals for connection to a voltage source, a relay including a coil and at least first and second normally open contacts with the relay coil and the first normally open contact being connected in series with the pair of spaced terminals, the second normally open contact when in closed condition connecting one of the aforesaid pair of spaced terminals in series with a third terminal, a thermal delay device including a current-responsive heater and a third normally open contact, the latter contact being closed in response to a predetermined period of current flow through the heater, the heater of the thermal delay device being connected in series with the aforesaid relay coil between the pair of spaced terminals, and the first and third normally open contacts being connected in parallel with the heater of the thermal delay device whereby closure of the third normally open contact in response to the predetermined period of current flow through the heater results in sufficient current flow through the relay coil to effect closure of the first and second normally open contacts, closure of the first normally open contact maintaining energization of the relay coil and effecting deenergization of the heater, and closure of the second normally open contact connecting the third terminal to one of the pair of spaced terminals resulting in full voltage being applied to the electric discharge device.

3,599,052
AUTOMOBILE SPEED CONTROL

Ralph W. Carp; William E. Howard; Michael Slavin, and Leoncio T. Ang, all of Baltimore, Md., assignors to The Bendix Corporation

Division of Ser. No. 677,697, Oct. 24, 1967, Pat. No. 3,455,411.
Filed June 16, 1969, Ser. No. 852,133
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 R **2 Claims**



An automobile speed control system wherein a voltage proportional to actual vehicle speed is fed through a low-loss memory capacitor to a comparator high input impedance port, momentary referring of which to a predetermined voltage impresses the vehicle instantaneous speed across the capacitor in the form of a command speed voltage. Thereafter, changes in vehicle speed cause the voltage at the comparator input port to change in accordance therewith, although the voltage across the capacitor remains constant. A voltage proportional to throttle position is applied through a feedback shaping circuit to the second comparator input port. The feedback circuit utilizes a DC feedback circuit paralleled by an AC feedback circuit to increase the throttle feedback signal when the throttle is moving. The error signal developed in the comparator is amplified and applied to a vacuum modulator which controls the pressure in a vacuum motor which, through a linkage, positions the throttle. A capacitor and resistance network may be switched into the comparator so as to vary the high input impedance port circuit voltage proportional to actual vehicle speed in accordance with the time constant of the network in such a manner as to cause the apparent vehicle speed to decrease, thereby causing the vehicle to accelerate at a predetermined rate. Control system turnoff circuitry is provided which tem-

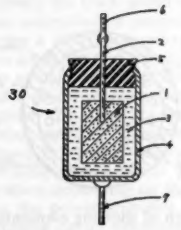
porarily disables the error signal amplifier whenever a turnoff voltage is applied thereto. This turnoff voltage may be applied by an operator-controlled switch which simultaneously places the memory capacitor in condition to record the instantaneous vehicle speed in the form of a command speed signal when the turnoff voltage is removed, thereby allowing the operator to cause the vehicle to decelerate to a new, lower command speed. Turnoff voltage may also be applied through a brake-operated switch. The control system is programmed to respond to voltage levels which are caused to appear at a system control point whenever the control point is shunted to ground through various resistances. These resistances are mounted in the vehicle steering column, thereby allowing all operator-initiated functions to be controlled through a single wire.

3,599,053

IMPROVED TITANIUM ALLOY CAPACITOR

Koreaki Nakata, Nishinomiya-shi, and Yoshio Iida, Osaka-fu, both of, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Osaka, Japan

Filed Oct. 31, 1969, Ser. No. 873,016
Claims priority, application Japan, Nov. 5, 1968, Mar. 20, 1969, 43/81529;44/22513
Int. Cl. H01g *9/04*
U.S. Cl. 317—230 **4 Claims**



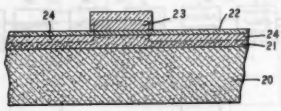
This invention relates to an improved electrical capacitor comprising, as an electrode, a binary alloy of titanium and aluminum or ternary alloy of titanium, zirconium and aluminum, said electrode having an anodic dielectric oxide film formed thereon. The novel capacitors have high capacitance and low leakage current at high voltages.

3,599,054

BARRIER LAYER DEVICES AND METHODS FOR THEIR MANUFACTURE

Martin P. Lepselter, New Providence, and Alfred U. MacRae, Berkeley Heights, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 22, 1968, Ser. No. 778,087
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 R **3 Claims**



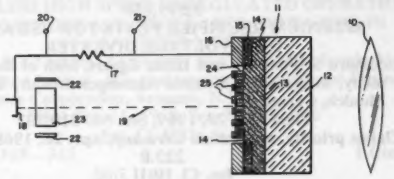
The specification describes an improved barrier layer device which utilizes an oxide guard ring around the barrier layer. An insulating guard ring is shown to be superior to the PN junction guard ring of the prior art. Manufacturing methods for forming oxide guard rings are also discussed. These involve forming the oxide layer by exposure to an oxygen plasma.

3,599,055

IMAGE SENSOR WITH SILICONE DIODE ARRAY

Murray Bloom, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 25, 1968, Ser. No. 778,574
Int. Cl. H01l *15/00, 15/02*
U.S. Cl. 317—234 **6 Claims**



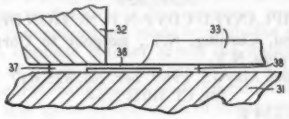
There is disclosed an image sensor of the type intended for conversion of an optical image into a series of electrical signals each of which represents in its magnitude the intensity of the picture element at a predetermined location of a sensor of a picture element on which an electron beam is impinging. The beam, of course, is scanned so as to sequentially impinge on a plurality of such sensors arranged in a pattern so that the raster or scan of the entire pattern generates a series of electrical signals representative of the entire picture.

3,599,056

SEMICONDUCTOR BEAM LEAD WITH THICKENED BONDING PORTION

James E. Clark, Coopersburg, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 11, 1969, Ser. No. 832,154
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **1 Claim**



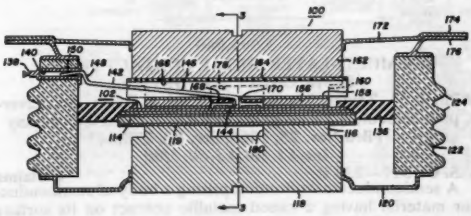
In semiconductor devices having beam leads a protuberant portion is provided on the bonding face of the beam at its outer end. This thickened portion controls the bonding area subjected to thermocompression bonding and avoids the deleterious effects which otherwise result from deformation and extrusion of the outer end of the beam lead.

3,599,057

SEMICONDUCTOR DEVICE WITH A RESILIENT LEAD CONSTRUCTION

William F. Lootens, Skaneateles, N.Y., assignor to General Electric Company

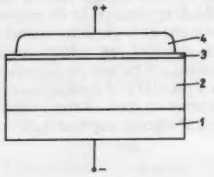
Filed Feb. 3, 1969, Ser. No. 796,136
Int. Cl. H01l *5/00, 11/00*
U.S. Cl. 317—234 **4 Claims**



A silicon-controlled rectifier is disclosed having a gate lead formed of a resilient spring. The deflection of the spring as-

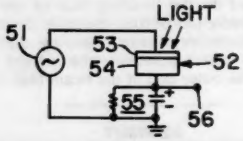
sures a good electrical connection of the lead both to the control surface of a semiconductive element and the housing terminal which is independent of other electrical connections to the semiconductor element. One major current carrying terminal is slotted to receive the spring in insulative relation, and the spring also centralizes a loose backup plate.

3,599,058
SELENIUM RECTIFIER PLATE FOR USE AS AN OVERVOLTAGE DIVERTER
Ekkehard Schillmann, and Heinz Eggert, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Apr. 28, 1969, Ser. No. 819,737
Claims priority, application Germany, Apr. 26, 1968, P 17 64 223.8
Int. Cl. H01l *3/02*
U.S. Cl. 317—241 **5 Claims**



It is known to use selenium rectifier plates which are loaded in blocking direction as overvoltage diverters, to protect silicon rectifiers, for example. The invention provides a selenium rectifier plate with a selenium layer of a thickness of at least 100×10^{-4} cm. and a weak halogen doping of at most 100 p.p.m. chlorine.

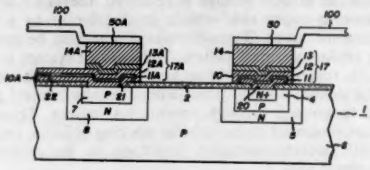
3,599,059
ION IMPLANTED CDS P-N JUNCTION DEVICE
Shou-Ling Hou, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 15, 1969, Ser. No. 825,017
Int. Cl. H01l *7/54*
U.S. Cl. 317—234 R **1 Claim**



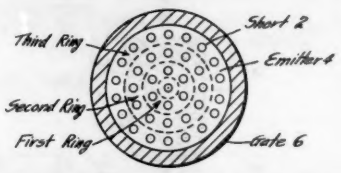
PN junction devices are made by bombarding the surface of a body of cadmium sulfide with the ions of an appropriate dopant element, and thereafter subjecting the cadmium sulfide body to an appropriate annealing schedule. The particular type of PN junction device and the characteristics thereof are determined by the particular schedule of annealing to which the implanted body is subjected.

3,599,060
A MULTI-LAYER METAL CONTACT FOR SEMICONDUCTOR DEVICE
William M. Triggs, Manlius, and Carl J. Byrns, Jr., Liverpool, both of, N.Y., assignors to General Electric Company
Filed Nov. 25, 1968, Ser. No. 778,647
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **6 Claims**

A semiconductor device comprising a body of semiconductor material having a raised metallic contact on its surface consisting of a bottom region, a middle region, and a top region. The bottom region, which is contiguous with a surface of the semiconductor body, comprises a semiconductor adherence-promoting metallic layer having an upper surface of aluminum. The top region comprises a metallic layer of connectable material to which external electrodes or leads can be easily bonded. The middle region is between the bottom region and the top region and comprises essentially a barrier layer of metallic material. The barrier layer prevents the mixing of the bottom and top regions without deleteriously affecting the electrical and thermal conductivity between these two regions.



3,599,061
SCR EMITTER SHORT PATTERNS
Richard A. Kokosa, Skaneateles, N.Y., assignor to The United States of America
Filed Sept. 30, 1969, Ser. No. 862,202
Int. Cl. H01l *11/00, 13/00*
U.S. Cl. 317—235 R **1 Claim**

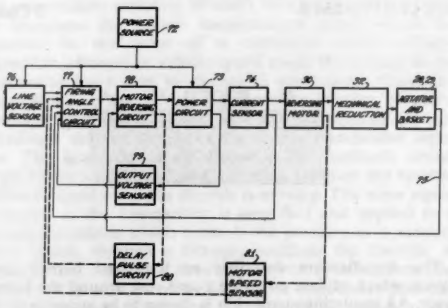


An improved pattern of shorting elements is provided for a controlled rectifier.

ERRATUM

For Class 318—176 see:
Patent No. 3,599,236

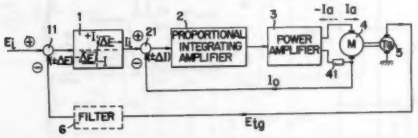
3,599,062
ELECTRONIC CONTROL CIRCUIT FOR DIRECT DRIVE AUTOMATIC
Burke J. Crane, Riverside, Ill.; Douglas J. Walker, St. Joseph, Mich., and George H. Myers, St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Division of Ser. No. 487,019, Sept. 13, 1965. Filed Aug. 7, 1967, Ser. No. 665,660
Int. Cl. H02p *5/06*
U.S. Cl. 318—281 **8 Claims**



A control circuit for a laundry machine motor which generally includes a power circuit coupled with a reversing circuit. A firing angle control circuit regulates the amount of

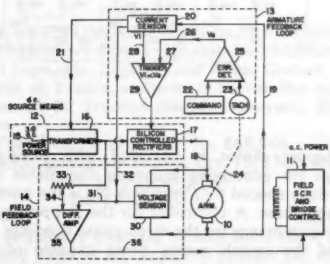
power supply to the motor from the power circuit and the reversing circuit controls the power circuit to establish the desired direction of rotation of the motor. In particular, the reversing circuit is operative to cyclically reverse the motor or to drive the motor in a single direction.

3,599,063
SPEED CONTROL SYSTEM FOR D.C. MOTOR
Sadaaki Nanai, and Nobuhiro Kyura, both of Fukuoka-ken, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukoka-ken, Japan
Filed Aug. 21, 1969, Ser. No. 851,945
Int. Cl. H02p *5/16*
U.S. Cl. 318—327 **7 Claims**



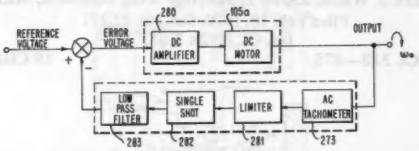
A control system is composed of a saturation amplifier delivering a positive or negative saturated voltage depending on the sign of a difference voltage between a command voltage and a negatively fed back speed-representing voltage of the motor to be controlled, a proportional and integrating amplifier receiving a difference voltage between the output of the saturation amplifier and a negatively fed back voltage representing the actual armature current through the motor as its input, and a power amplifier amplifying the output of the second amplifier for supplying the armature current for the motor. In other aspects of the invention, the first amplifier may be replaced by another proportional and integrating amplifier cooperating with a circuit portion prohibiting the integrating operation depending on the output of the replacing amplifier, or the power amplifier may be replaced by a DC current switching circuit employing an amplitude modulated pulse signal for switching the armature current of the motor as desired.

3,599,064
D.C. MOTOR DRIVE USING COMBINED ARMATURE AND FIELD CONTROL
Jay Friedman, Lawndale, Calif., assignor to Loyola Industries, Inc.
Filed Oct. 29, 1969, Ser. No. 872,025
Int. Cl. H02p *5/16*
U.S. Cl. 318—338 **3 Claims**



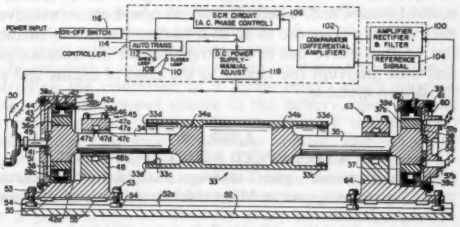
A DC motor drive for the armature and associated field winding of the motor includes an armature feedback loop responsive to the current flow in the armature, an input command signal such as a speed control signal, and the actual speed of the armature for providing a control of the current supplied by a DC source means to the armature to thereby provide speed control of the motor. A field feedback loop control is also provided and includes means responsive to the voltage across the armature and to the line voltage supplied to the armature for providing a control of the field intensity to assure that the back EMF of the armature is always less than the available DC voltage supplied to the armature. This dual feedback control provides for a faster response time of the armature throughout its total speed range together with the feature of a constant torque for different speeds.

3,599,065
CONTROL ARRANGEMENT FOR MOTOR TO ESTABLISH HIGH SPEED UNREGULATED OPERATION IN ONE MODE AND REGULATED OPERATION IN ANOTHER MODE
Chester M. Fackler, Lexington, and David H. Lenderking, Versailles, both of, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 15, 1968, Ser. No. 767,760
Int. Cl. H02p *5/16*
U.S. Cl. 318—345 **1 Claim**



The invention concerns motor operating and motor-regulating circuits, particularly set in a dictating and transcribing environment. The circuits insure a fast startup time for the motor whether the conventional AC power source or battery is used. During startup time, the full potential is applied across the motor and at a predetermined speed, the regulating circuit becomes effective to maintain the speed. This action applies during recording and playback operations. During other operations, such as a record media loading and phasing operation and an automatic erase operation, the full power supply is applied across the motor as long as necessary to complete the operation and the regulating circuit remains ineffective. During an automatic recall operation enabling a transcriber to listen to a few previous words of dictated material, connections are made to apply the available potential in an opposite manner across the motor to reverse its direction of rotation and the regulating circuit also remains ineffective. Provision is also made for establishing a relatively high and low speed of operation of the motor to achieve 10 and 20 minute recording times, respectively. The rapid startup time permits a direct coupling of the motor to the driving mechanisms and elimination of an intermediate clutch assembly.

3,599,066
CONTROL MEANS FOR INTERMITTENT MOTION MECHANISM
William S. Touchman, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Continuation-in-part of application Ser. No. 660,032, Aug. 11, 1967, now Patent No. 3,460,343. This application Aug. 11, 1969, Ser. No. 849,110
Int. Cl. H02k *23/16*
U.S. Cl. 318—437 **4 Claims**



Control means for an intermittent, rotary-motion mechanism which operates at the resonant frequency of its rotating system. The rotating system includes an input member, an output member, and a resilient member (like a

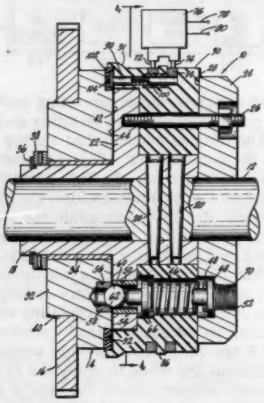
torsion shaft) interconnecting the input and output members. An exciter, like a magnetic oscillator, is used to start the rotating system and keep it oscillating at its resonant frequency to cause periodic dwells in the output member while the input member is rotated at a constant velocity. The control means includes a magnetic pickup for sensing the angles of oscillation of the output member and comparator circuits for comparing the output of the pickup with a reference signal. A controller circuit, acting in response to the comparator circuit, is used to control the voltage to a motor which rotates the input member. The motor has operating characteristics which enable it to produce an increase or a decrease in torque at a substantially constant speed.

3,599,067

OVERLOAD DISCONNECT ARRANGEMENT

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich.

Filed Feb. 18, 1970, Ser. No. 12,271
Int. Cl. H02h *7/085*
U.S. Cl. 318—475 19 Claims



A safety overload disconnect arrangement between a pair of coaxial driving and driven rotary members which includes a plurality of axially spring-biased bearing balls mounted on one of the members and spaced circumferentially around the axis of rotation thereof. The balls engage in registering sockets on the other member to yieldably couple the members together for rotation in unison. In response to a predetermined overload on the driven member the bearing balls retract from the sockets on the other member and thereby permit the driving member to rotate relative to the driven member. The driving member is adapted to be rotated by electrically controlled means connected to a power source through a circuit completed through a pair of annular slip rings on one of the members, each slip ring being connected with an axially extending brush. When the two members are in coupled relation the two brushes make contact with a contact plate on the other member to complete the circuit to the control means and, when the two members rotate relative to each other in response to an overload on the driven member, the brushes move out of registration with the contact plate and thus interrupt the circuit to the control means and stop the driven member.

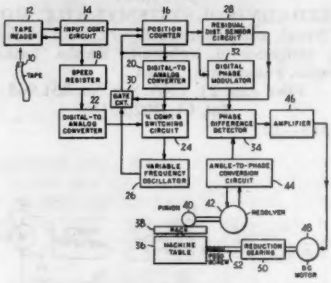
3,599,068

LOCATING SPEED REDUCTION DEVICE

Taka-aki Kanamori, and Yasutsugu Juroda, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1968, Ser. No. 784,856
Claims priority, application Japan, Dec. 22, 1967, 42/82343
Int. Cl. G05b *19/28*
U.S. Cl. 318—600 2 Claims

A numerically controlled machine tool is first moved at a constant speed determined by a corresponding speed information signal until it reaches a predetermined distance from its command position. Then a position information signal representing the distance of movement of the member is coupled to control the pulse repetition frequency of a variable frequency oscillator having its output coupled to a position



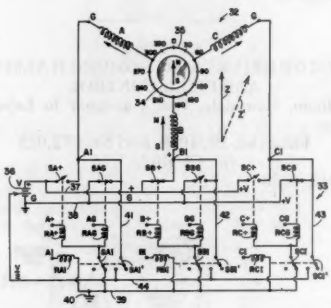
counter, thereby causing the counter to count down. The number of pulses in the form of a phase of square waveform is compared with the actual position of the member in the similar form and a difference between them is used to energize a drive device for the member. When the counter clears, the member reaches its command position and stops.

3,599,069

MULTIPHASE STEPPER MOTOR AND CONTROLLER INCLUDING MEANS TO SHORT CIRCUIT AN INHIBITED WINDING

Elvin C. Welch, Culver City, Calif., assignor to American Digital Corporation

Filed Aug. 27, 1969, Ser. No. 853,322
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 9 Claims

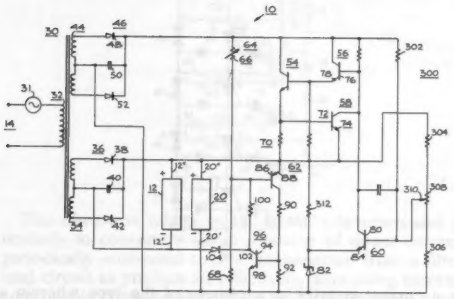


A stepper motor is provided with three-phase stator windings for generating magnetic flux fields in directions sequentially spaced 60°/Np where Np is the number of stator poles per phase. A controller for the stepper motor includes three switch means for the three-phase windings respectively, each of the switch means being capable of three states wherein the associated winding is energized in one sense, or an opposite sense, or is inhibited from energization. By causing the switch means to assume various states in accord with a predetermined sequence, multiple-winding excitation is realized in such a way that high efficiency in terms of ampere turns per watt results with the added advantage that a smaller stepping angle and thus higher stepping speed is achieved. A rotor for the stepper motor is preferably of the permanent magnet type and incorporates a number of permanent magnet poles equal to the number of stator poles per phase. The use of the permanent magnet provides desirable damping characteristics.

3,599,070
BATTERY CHARGER AND EMERGENCY POWER SUPPLY FOR ILLUMINATION DEVICE

Howard Davis, Canoga Park, and Jerry J. Silvers, Los Angeles, both of, Calif., assignors to Siltron, a division of Lighting Corporation of America

Filed Sept. 17, 1969, Ser. No. 858,751
Int. Cl. H02j 7/10
U.S. Cl. 320—5 8 Claims



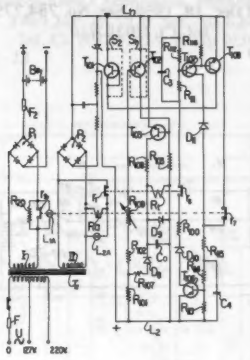
An improved battery charger and power supply arrangement for illumination devices is provided to power the same illumination device under both a normal operating condition from standard line power, and an emergency operating condition in the absence of line power, from a self-contained battery. The emergency operating condition occurs when the magnitude of the voltage in the line comprising the primary source of electrical energy drops below a preselected value and semiconductor devices are utilized to provide automatic switching at this time to the emergency mode of operation. In the emergency mode of operation the battery is utilized to power the illumination device and the unit contains circuitry for allowing battery charging from the primary source of electrical energy during normal operation and automatic switching to effectively terminate the battery charging function during an emergency operation. There is also achieved switching by means of a voltage controlled signal from the primary source of electrical energy during normal operation to the power from the battery during emergency operation. No mechanical parts are utilized and all operations are achieved by electrical means.

3,599,071
THERMALLY-RESPONSIVE CONTROLLED CHARGING ARRANGEMENT FOR STORAGE BATTERIES

Robert Henri Lapuyade, Enghien, and Pierre Godard, Livry-Gargan, both of, France, assignors to Societe Des Accumulateurs Fixes Et De Traction (Societe Anonyme), Romainville, France

Filed Oct. 13, 1969, Ser. No. 865,546
Claims priority, application France, Oct. 15, 1968, Aug. 6, 1969, 170,015; 69-27049
Int. Cl. H02j 7/10
U.S. Cl. 320—35 28 Claims

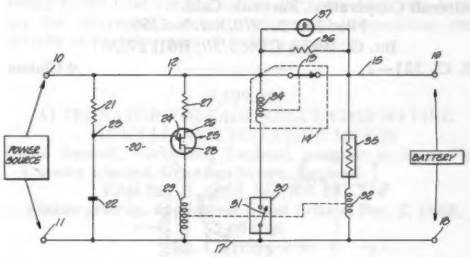
Thermally-responsive charging arrangement for a storage battery supplied from an AC source to provide DC charging voltage to the storage battery terminals, the arrangement being capable of charging at a high rate or at lower or zero rates as required, including a thermal probe responsive to battery temperature and a thermal probe responsive to ambient temperature, these probes being interconnected to supply a signal output which is a function of the difference between battery and ambient temperatures. The signal output actuates a control for the charging arrangement to switch its operation from high to lower or zero charging rates and vice versa respectively when the temperature difference detected by the thermal probes has a determined maximum value and a determined minimum value. The thermal probes may be resistances or transistors conductivity of which are functions of their temperatures. Timing means are also provided for limiting the period during which the battery is charged at a high rate.



3,599,072
BATTERY CHARGER REGULATOR CIRCUIT FOR PERIODICALLY SUPPLYING CHARGING CURRENT TO A BATTERY

Richard B. Becker, 8534 Ocean View Ave., Whittier, Calif.

Filed Oct. 6, 1969, Ser. No. 863,795
Int. Cl. H02j 7/10
U.S. Cl. 320—31 17 Claims

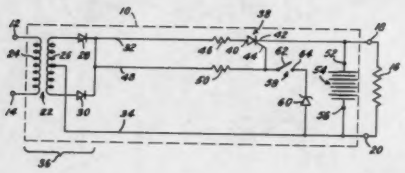


There is disclosed herein a regulator circuit for use with a power source, such as a battery charger, for efficiently bringing a battery charge up to a proper value and through the gasing point without significant heating of the battery. The circuit employs a semiconductor timing circuit for properly controlling the operation of a series relay, which supplies current from the power source to the battery, upon nearing and reaching full charge. The series relay includes two windings, one responsive to battery voltage, and the other responsive to the timing circuit. The circuit arrangement allows the approach point of full charge to be sensed and causes the relay to switch to a trickle charge. A heavy charge then is periodically, for example every several minutes, applied as the battery reaches full charge, and to continually maintain the full charge. The present regulator brings the battery through the gasing point slowly by applying a continuous heavy charge until the battery nears the full charge value, and the charge is reduced as the full charge is reached and maintained.

3,599,073

VOLTAGE-REGULATED POWER SUPPLY WITH STANDBY POWER CAPABILITY

Arthur W. Wilson, Attleboro, Mass., and Bertrand J. Misek, Pawtucket, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

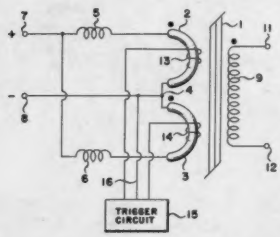
Filed Dec. 18, 1968, Ser. No. 784,779
Int. Cl. H02j 7/10
U.S. Cl. 320—39 7 Claims

A voltage-regulated power supply with standby power capability particularly adapted for use in data-processing equipment and the like is shown to comprise a sealed, rechargeable battery to be connected across a load for determining load voltage and for cooperating in meeting current demands of the load, a direct current energy source arranged to provide charging current to the battery and to cooperate in meeting the current demands of the load, and control means regulating the charge state of the battery for maintaining load voltage within selected limits.

3,599,074

HIGH-POWER DIRECT-CURRENT TO SQUARE-WAVE CONVERTER UTILIZING AN INDUCTIVELY COUPLED GAS DISCHARGE TUBE

Robert H. Adams, Sun Valley, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 2, 1970, Ser. No. 356
Int. Cl. H02m 1/06, 3/30; H01f 27/28
U.S. Cl. 321—2 4 Claims



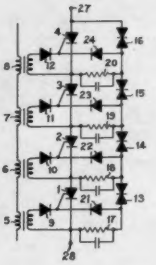
A high-power square wave generator employing a transformer, the core of which has a rectangular hysteresis loop and the center-tapped primary winding of which comprises a pair of triggered gas discharge tubes. Alternate firing of the discharge tubes induces a square wave in the transformer's secondary winding. The device may be utilized as the power carrier source for very-high-power carrier amplifiers of the silicon controlled rectifier, thyratron, or magnetic amplifier type. An alternate embodiment employs a nonsaturating ferrite core in lieu of a rectangular loop core, and an auxiliary gas discharge tube shunted across the secondary winding for switching control.

3,599,075

PROTECTIONS CIRCUIT FOR SERIES CONNECTED SOLID STATE VALVES

Peter Etter, Baden, and Werner Faust, Wettingen, both of, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 4, 1969, Ser. No. 873,808
Claims priority, application Switzerland, Nov. 8, 1968, 16696/68
Int. Cl. H02m 1/18; H02n 7/14
U.S. Cl. 321—11 1 Claim



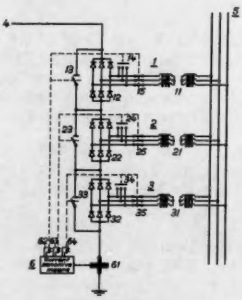
In a current-inverter arrangement of the type wherein a plurality of current-inverter valves, particularly thyristors, are connected in series, a pair of diodes of opposite polarity and a low-ohmic impedance unit are connected in series across each of at least some of the thyristors. The impedance unit is connected to the firing control electrode of the associated thyristor and the voltage drop produced across it in the event that a particular thyristor is not fired by a firing impulse regularly applied to its control electrode from a control transformer, provides an additional firing impulse for the thyristor.

3,599,076

OVERLOAD PROTECTOR FOR SHORT-CIRCUITING STATIC CONVERTERS IN RESPONSE TO INCREASES IN THE DIRECT CURRENT

Carl Ingvar Boksjo, and Hans Stackegard, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 17, 1967, Ser. No. 675,824
Claims priority, application Sweden, Oct. 17, 1966, 140/41
Int. Cl. H02m 1/18; H02h 7/12
U.S. Cl. 321/14 3 Claims

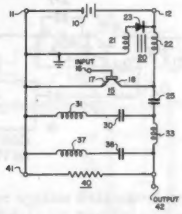


A static converter is provided with short-circuiting means on both the DC and AC sides, and with means to operate the short-circuiting means and to disconnect the AC side upon an increase in the DC current above a predetermined value; the current sensitive device operates the short-circuiting means successively with low time derivatives of the direct current and simultaneously with higher time derivatives.

3,599,077
HIGH-EFFICIENCY, CONTROLLABLE DC TO AC CONVERTER

Dieter R. Lohrmann, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed June 18, 1970, Ser. No. 47,503
Int. Cl. H02m 7/48
U.S. Cl. 321—44 4 Claims

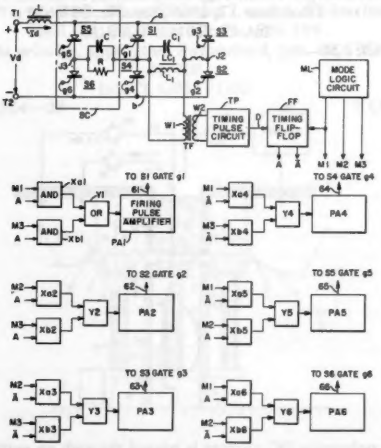


This disclosure relates to DC to AC converters and particularly to converters where a source of direct current is periodically connected to and disconnected from a filtered load circuit to produce an effectively, alternating current of controllable characteristics in the load circuit. More particularly, this disclosure relates to a converter that includes an inductor, in the switched DC circuit, with an additional winding connected to feed back current to the source of direct current during the half cycle when the DC source is disconnected from the load.

3,599,078
STARTING CIRCUIT FOR PARALLEL TUNED INVERTER

Brian R. Pelly, Murrysville, and Mario G. Tarjan, Pittsburgh, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1970, Ser. No. 34,805
Int. Cl. H02m 7/52
U.S. Cl. 321—45 S 8 Claims

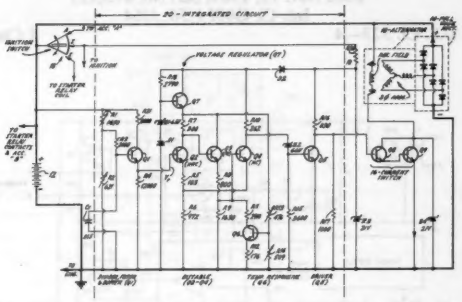


An inverter for supplying a parallel tuned load is disclosed including a plurality of controlled switching devices, such as thyristors, a starting circuit and a control circuit for controlling the switching devices and the starting circuit. The inverter is operative to store energy prior to starting, to utilize the stored energy to excite the tune load into oscillation and to operate normally when the oscillations have reached a sufficient magnitude.

3,599,079
TEMPERATURE-CONTROLLED VOLTAGE REGULATOR

Peter M. Ansbro, North Wales; Matthew C. Ryan, Lansdale, and Lawrence M. Yerger, Spring Mount, all of, Pa., assignors to Phiko-Ford Corporation, Philadelphia, Pa.

Filed Jan. 29, 1970, Ser. No. 6,665
Int. Cl. H02h 3/28; H02p 9/30
U.S. Cl. 322—23 11 Claims

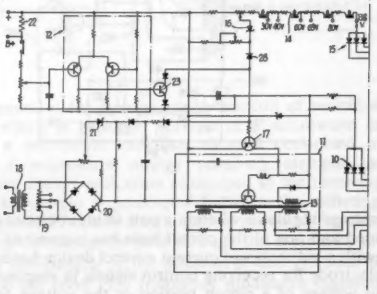


A temperature-controlled automobile voltage regulator comprising an emitter-coupled bistable circuit responsive to the alternator voltage for operating a current switch which so controls the current in the generator's field winding that the alternator voltage bears a predetermined desired relationship to the ambient temperature of the regulator over a wide range of temperatures. A buffer stage, comprising an emitter-follower transistor amplifier, provides interstage coupling between the input and output stages of the bistable circuit. A temperature responsive circuit, comprising a transistor whose emitter-collector circuit is connected across part of the emitter resistance of the buffer stage, lowers the emitter resistance of the buffer stage as ambient temperature rises, thereby lowering the switching voltages of the bistable circuit. As a result the average current supplied by the current switch to the field winding of the alternator decreases, lowering the alternator's output voltage as temperature rises, thereby to provide optimum battery charging.

3,599,080
ALTERNATOR VOLTAGE REGULATOR HAVING AUXILLIARY EXCITATION MEANS

David Bennett, Northfleet, England, assignor to Stone-Platt Crawley Limited, Crawley, Sussex, England

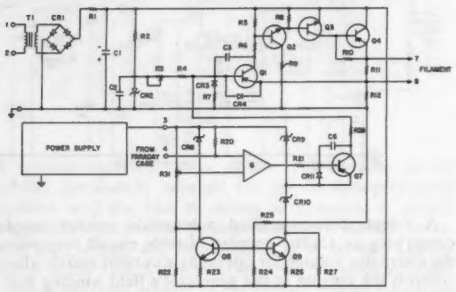
Filed Dec. 1, 1969, Ser. No. 881,214
Claims priority, application Great Britain, Dec. 2, 1968, 57,094/68
Int. Cl. H02p 9/30
U.S. Cl. 322—28 4 Claims



Apparatus for regulating the field current of an alternator comprises a negative feedback circuit and thyristor means by which the field current is turned on and off, wherein auxilia-

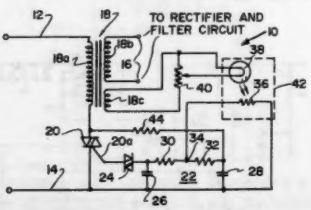
ry, sensitive, thyristors which are capable of functioning at the low alternator voltages produced by residual magnetism on starting are provided in shunt with main thyristors which take over when the alternator voltage has built up.

3,599,081
IONIZER EMISSION AND FILAMENT CURRENT REGULATING CIRCUIT
Robert M. Bryndza, San Jose, Calif., assignor to Electronic Associates Inc., Long Branch, N.J.
Filed Nov. 12, 1969, Ser. No. 875,921
Int. Cl. G05f 1/58, 1/64
U.S. Cl. 323—4 **1 Claim**



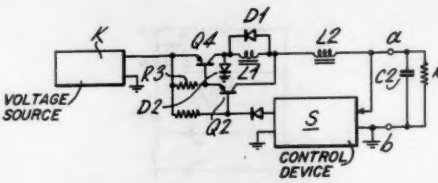
A control circuit for an ionizer used in a quadrupole mass analyzer. The circuit relates the current supplied to the filaments (filament current) and the current output of the ionizer (emission current) such that when a desired emission current level is established, the circuit provides a filament current necessary to produce that emission current level. The emission current is sensed and compared with a reference level for this current in a comparator. The comparator output appropriately braces a current-regulating transistor in the filament supply as a function of the comparison.

3,599,082
LIGHT-RESPONSIVE VOLTAGE REGULATOR FOR ALTERNATING-CURRENT SOURCE
Emil E. Besier, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Jan. 22, 1970, Ser. No. 5,050
Int. Cl. G05f 1/44
U.S. Cl. 323—21 **6 Claims**



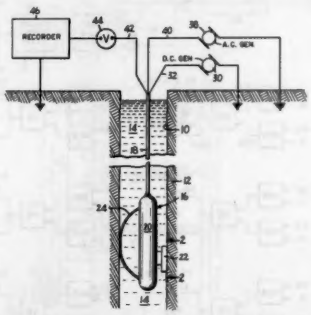
A voltage regulator wherein a pair of input circuit lines are provided and one of the circuit lines has connected in series therewith a bidirectional current control device having a control electrode for receiving control signals in response to the output voltage of a circuit portion of the voltage regulator. The control signals applied to the control electrode of the current control device are developed in response to light intensity of a light-emitting element connected to and energized by, the circuit portion.

3,599,083
SWITCHING MEANS FOR THE REGULATION OF A DC VOLTAGE
Per Bugge-Asperheim, Guldbergs vei 5, Oslo 3, Norway
Filed Aug. 4, 1969, Ser. No. 847,064
Claims priority, application Norway, Aug. 5, 1968, 3073/68
Int. Cl. G05f 1/56
U.S. Cl. 323—22 T **5 Claims**



A pulse-duration modulated voltage regulator, wherein improved efficiency is achieved by stabilizing the emitter-to-collector voltage of the driver transistor by means of a parallel connection of an inductance and a rectifier diode in series with the switching transistor and the emitter-collector terminals of the driver transistor are serially connected with a load resistor connected across the above series connection. Greater efficiency and increased reliability are obtained by minimizing the transition time needed for transferring the switching transistor from its conducting to its nonconducting state by means of a double control process, which renders the driver transistor nonconducting and short circuits its load resistance when the switching transistor is to be made nonconductive, and to perform the reverse process when the switching transistor is to be made conductive. The actuation of the driver transistor is preferably performed before the short- and open-circuiting of the load resistor, respectively.

3,599,084
METHOD AND APPARATUS FOR INVESTIGATING THE PERMEABILITY OF EARTH FORMATIONS IN A BOREHOLE BY DETERMINING POLARIZATION LEVELS BEFORE AND AFTER SONICALLY INDUCED FORMATION FLUID FLOW
Barkev Y. Bakamjian, New Canaan, Conn., assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed June 12, 1969, Ser. No. 832,612
Int. Cl. G01v 3/02, 3/18
U.S. Cl. 324—1 **9 Claims**

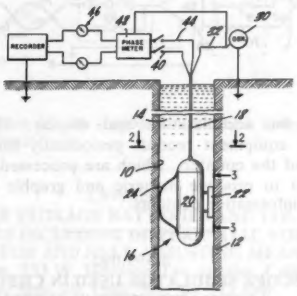


A polarizing DC current is passed through an earth formation traversed by a bore hole and the polarization level of the formation is determined by measuring the resistivity of the formation electrolyte. The formation is then excited by a sonic transducer to cause fluid flow through the formation. During excitation of the formation, the polarization level is again determined and the reduction in the polarization level from the original level is observed to obtain indications of the extent of fluid flow present and hence of the relative or actual permeabilities of the formation.

3,599,085
APPARATUS FOR WELL LOGGING BY MEASURING AND COMPARING POTENTIALS CAUSED BY SONIC EXCITATION

Adelbert Semmelink, Chicago, Ill., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed June 12, 1969, Ser. No. 832,679
Int. Cl. G01v 3/18
U.S. Cl. 324—1 9 Claims

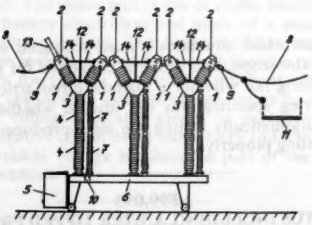


A sonic transducer in contact with the surface of a formation traversed by a bore hole periodically excites the formation at low frequencies to cause periodic flow of the formation fluid and therefore periodic electrokinetic potentials to be created in the formation. The potentials are measured at a location near the transducer and at least at one other location spaced from the transducer, and the ratio of the measured potentials provides knowledge of the electrokinetic skin depth of the formation and thus of the relative and actual permeability of the formation.

3,599,086
METHOD FOR INSPECTING A HIGH-VOLTAGE SWITCH WHILE ENERGIZED WITH OPERATING VOLTAGE

Adrian Werner Roth, Wasserfluhweg 7, Aarau, Switzerland

Filed Dec. 24, 1968, Ser. No. 786,599
Claims priority, application Switzerland, Jan. 11, 1968, 583/68
Int. Cl. G01r 31/02
U.S. Cl. 324—28 1 Claim

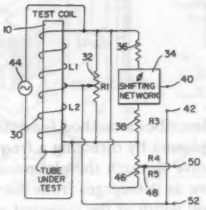


A method is provided for inspecting a high-voltage switch unit, while it is energized with operating voltage, from a platform insulated from ground, wherein all breaks of the switch apparatus are shunted by a bypass device for the duration of the inspection after previous verification of the closed switching position, the bypass device being removed only after the closed position of the switch apparatus has been again verified.

3,599,087
EDDY CURRENT TEST SYSTEM WITH MEANS FOR ELIMINATING SIGNALS DUE TO THE END OF THE TEST PIECE

John W. Allen, Malvern, and Merrill M. Godshall, Warminster, both of, Pa., assignors to Air Products and Chemicals, Inc.

Continuation of application Ser. No. 576,606, Sept. 1, 1966. This application Feb. 24, 1970, Ser. No. 14,753
Int. Cl. G01r 33/12
U.S. Cl. 324—40 11 Claims

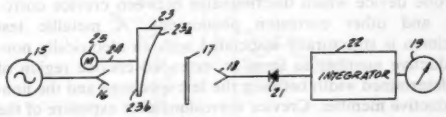


An eddy current material tester is described which includes a balanced bridge network. The bridge network includes a sensing coil whereby the element to be tested for flaws or defects is passed through the coil. When the ends of the element under test pass through the coil, the bridge becomes unbalanced and provides an output signal to a gate circuit which is connected to an alarm. Circuitry is included which emits signals to the gate if a flaw or defect is detected. Further circuitry is included to provide a signal if the signals emitted to the gate are of a predetermined threshold level. This level is indicative of the end of the material under test. The gate is not enabled in the presence of a signal of the predetermined threshold level. The gage is held closed for a predetermined time which may allow the end of the material to pass through the sensor coil. Defect signals are delayed before being presented to the alarm through the gate.

3,599,088
MICROWAVE MOISTURE SENSING SYSTEM INCLUDING MEANS TO CONTINUOUSLY CHANGE THE TRANSMISSION PATH OF THE MICROWAVE ENERGY

Leroy H. Busker, Rockton, Ill., and Robert J. Mosher, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Oct. 31, 1967, Ser. No. 679,325
Int. Cl. G01r 27/04
U.S. Cl. 324—58.5 3 Claims



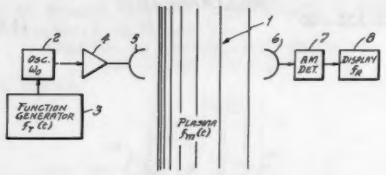
An apparatus for measuring the amount of moisture in a sample which is generally formed of a microwave energy source, a microwave radiating element connected to the source, a microwave energy receiving element, and a microwave energy indication connected to the receiving element. The sample is positioned between the radiating and receiving elements and a structure is provided for changing the energy transmission path through the sample by at least one-half wavelength of the microwave energy. Such means may take the form of a frequency modulator connected to the source, a dielectric disc in the transmission path, or a structure for continuously changing the distance between the radiating element and the sample or combination of these means.

3,599,089

GRADIENT SOUNDER

Dimitri S. Bugnolo, Portsmouth, R.I.

Filed July 24, 1969, Ser. No. 844,531
Int. Cl. G01r *27/04*
U.S. Cl. 324—58.5 **2 Claims**



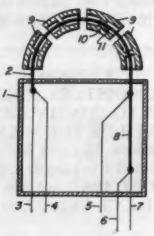
This invention describes a method for determining the density gradient of a plasma by directing a frequency modulated electromagnetic wave through the plasma, detecting the amplitude of this wave as it emerges from the plasma and measuring the minimum width of the detected amplitude peak as the FM modulation function is changed so as to correspond to the inverse of the spreading function of the plasma.

3,599,090

APPARATUS FOR DETECTING AND MEASURING CREVICE CORROSION

Vincent F. Fitzpatrick; Russell B. Richman, and James R. Divine, all of Richland, Wash., assignors to The United States of America as represented by the Secretary of the Interior

Filed June 30, 1969, Ser. No. 837,816
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 C **7 Claims**



Crevice corrosion may be detected and measured by use of a probe device which discriminates between crevice corrosion and other corrosion phenomena. A metallic test specimen is structurally associated with an electrically nonconductive member to form an extended crevice region of predetermined width between the test specimen and the nonconductive member. Crevice corrosion, after exposure of the probe to a corrosive environment, is determined by measuring the electrical resistance of the test specimen relative to a shielded reference electrode.

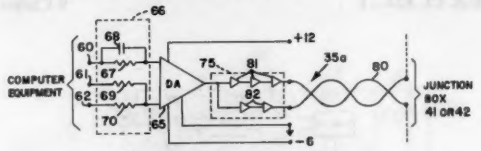
3,599,091

SYSTEM UTILIZATION MONITOR FOR COMPUTER EQUIPMENT

Charles D. Warner, Jr., Los Gatos, Calif., assignor to Computer Synectics, Inc., Santa Clara, Calif.

Filed Oct. 24, 1969, Ser. No. 869,308
Int. Cl. G01r *15/12, 31/02*
U.S. Cl. 324—73 **10 Claims**

Apparatus for monitoring the utilization of computer equipment wherein the presence or absence of digital signals are measured for both duration of events and the number of event occurrences. An isolation probe within an input section senses digital signals in a computer system without imposing line loading and without degrading system performance for transmission to a Boolean logic circuit, which produces logical combinations of the digital input signals. The logic circuit feeds the logical combinations of the digital input signals to counters for accumulation and display. Magnetic tape recording equipment records periodically the information contents of the counters, which are processed by computer equipment to produce numeric and graphic forms of the recorded information contents.

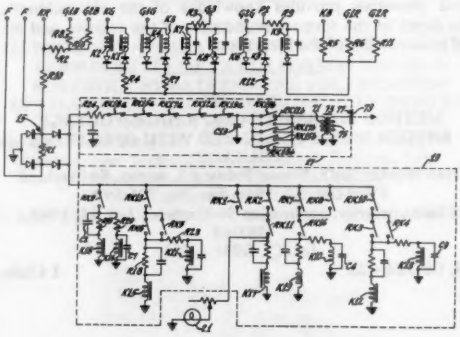


3,599,092

KINESCOPE SIMULATOR USED IN CHECKING AN AUTOMATIC TESTING SYSTEM

Herbert William Silverman, Sudbury, Mass., assignor to RCA Corporation

Division of Ser. No. 662,360, Aug. 22, 1967, Pat. No. 3,541,440.
Filed Mar. 12, 1970, Ser. No. 18,916
Int. Cl. G01r *35/00*
U.S. Cl. 324—158 R **2 Claims**



Apparatus which simulates a mass-produced article, such as a color kinescope, and which is employed for the purpose of ascertaining not whether a manufactured article is within manufacturing specifications but instead whether a system which is automatically testing the mass-produced articles is itself operating properly.

3,599,093

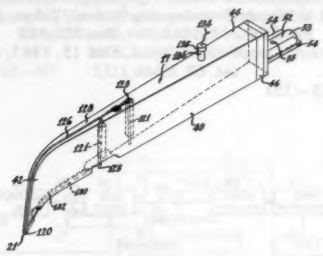
APPARATUS INCLUDING A WIRE TIPPED PROBE FOR TESTING SEMICONDUCTOR WAFERS

William Lee Oates, Somerset, N.J., assignor to RCA Corporation

Division of Ser. No. 651,885, July 7, 1967, Pat. No. 3,453,545.
Filed Apr. 28, 1969, Ser. No. 819,828
Int. Cl. G01r *31/22, 31/02*
U.S. Cl. 324—158 P **2 Claims**

An apparatus for sequentially testing devices on a semiconductor wafer comprising a support column including means for receipt of a removable platform on which a wafer to be tested is mounted. A plurality of probes are disposed about

the support column. The probes have a bird-beaklike shape and are thin in comparison to their width, whereby a large



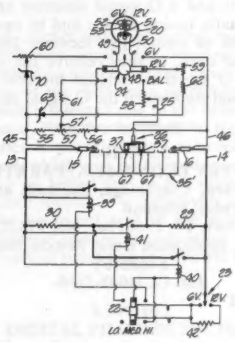
number of probes can be disposed in circular array around the support column.

3,599,094

TESTER FOR STORAGE BATTERIES AND VOLTAGE REGULATORS INCLUDING DIFFERENTIAL VOLTAGE INDICATOR AND NULL ADJUSTING MEANS

Vernon R. Pring, 233 W. Jefferson, Los Angeles, Calif.

Filed Sept. 20, 1968, Ser. No. 773,686
Int. Cl. G01n *27/46*
U.S. Cl. 324—29.5 **12 Claims**



Apparatus for checking the go no-go condition of a storage battery under load and the proper setting of a vehicle voltage regulator. The tester indicates which of two sections of a battery is defective by indicating whether either section is unable to produce an acceptable voltage output under an appropriate load. The tester makes use of probe means insertable into the battery electrolyte and made of a material not subject to galvanic action. The tester includes various adjustable means including manufacturing tolerance compensators, selectors for loading batteries of different ratings and voltages with appropriate loads as well as means for changing the range of voltage indicator means to permit its use to check the operative condition of the battery and alternatively to adjust a vehicle voltage regulator as part of the battery-checking operations.

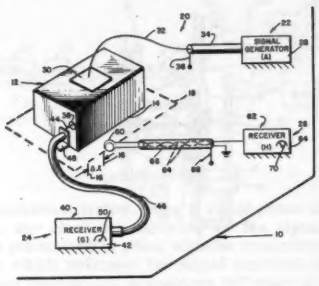
3,599,095

METHOD OF AND MEANS FOR TESTING AN ELECTRICAL BOND TO DETERMINE ITS HIGH-FREQUENCY IMPEDANCE

William R. Johnson, Cranada Hills, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 12, 1970, Ser. No. 2,008
Int. Cl. G01r *27/14*
U.S. Cl. 324—64 **8 Claims**

A method of and means for testing an electrical bond between two conductors, such as a ground plate and a radio frequency shielded enclosure bonded to the plate, to determine the high frequency impedance of the bond. The test procedure involves passing a high frequency current through the conductors and the bond, measuring the voltage drop across the bond by placing a capacitance probe in capacitively coupled relation to one conductor and measuring the voltage of the probe relative to the other conductor, and measuring the high frequency current flow at a number of measurement positions spaced along a closed path on the surface of



the latter conductor encircling the bond by placing an inductance probe in inductively coupled relation to the surface at each position and measuring the voltage induced in the latter probe at each position. The high frequency impedance of the bond is then obtained by using the equation:

$$Z = \frac{V}{\Sigma H \cdot \Delta L}$$

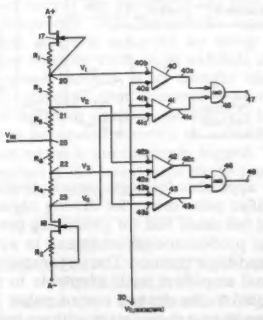
where Z is the impedance, V is the capacitance probe voltage, H is the inductance probe voltage, and ΔL is the distance between measurement positions.

3,599,096

INFINITE RESOLUTION MULTIPLE VOLTAGE WINDOW COMPARATOR

Jon C. Stemples, Coral Gables, and Samuel R. Everett, Ft. Lauderdale, both of, Fla., assignors to The Bendix Corporation

Filed Jan. 17, 1969, Ser. No. 792,177
Int. Cl. G01r *17/00*
U.S. Cl. 324—140 **7 Claims**

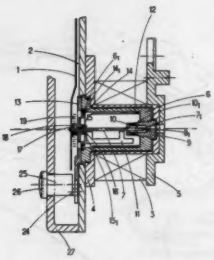


Each comparator of a plurality of comparators receives as one input one of a plurality of voltages sampled from intermediate points in a resistor string which is fed by a constant current source. Each comparator also receives as a second input as unknown voltage. The sampled voltages define voltage windows with an output signal being generated when the unknown voltage falls within one or the other of the windows. A window level voltage is impressed at an intermediate point in the resistor's string. Variation of the window level voltage causes the voltage windows to be translated along a voltage magnitude scale.

3,599,097
MEASUREMENT APPARATUS INCLUDING ZERO SETTING MEANS

Jacques Palencher, and Michel Penard, both of Troyes, France, assignors to Lebocey Industries, Troyes, France

Filed Apr. 1, 1969, Ser. No. 811,897
Claims priority, application France, Apr. 11, 1968, Mar. 17, 1969, 1572361;6907560
Int. Cl. G01r 1/00
U.S. Cl. 324—154 6 Claims

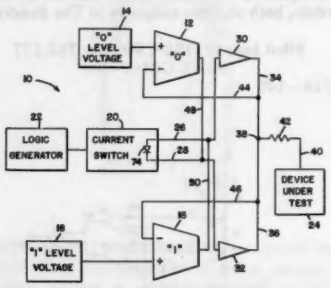


The present invention relates to a measurement device, particularly of electrical units, which includes a fixed measurement part and a mobile assembly, the whole of which forming the measurement components properly so called, the mobile assembly being fitted with a rotatable axle held in position and guided close to its tips, a needle and at least one release spring on said rotating axle.

3,599,098
ELECTRONIC TESTING APPARATUS

James H. McPhail, Santa Clara, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Feb. 25, 1969, Ser. No. 802,086
Int. Cl. G01r 31/00; G06g 7/12
U.S. Cl. 324—158 T 7 Claims

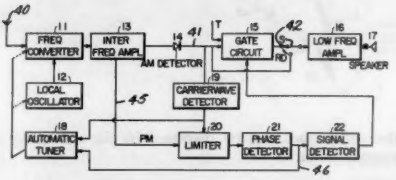


A testing apparatus for logic circuit devices comprising a buffer amplifier pulse driver for driving capacitive loads with fast rise and fall times and for producing programmable output pulses at predetermined levels and in accordance with a predetermined logic pattern. The apparatus comprises a pair of operational amplifiers each adaptable to receive an input at a level equal to the desired output pulse. Each of the amplifiers has an output driver stage with an input connected to and driven by a current switch adaptable to receive a controlling logic input pulse in the same pattern desired at the apparatus output which is connected to the device being tested. The current switch provides the necessary drive to enable the output driver stages to bring the output to the desired level, and once that level is reached during each transition it is held constant by the operational amplifier until the next transition pulse from the logic input. The driver switches function to provide the pulse transitions to and from predetermined levels independent of the operational amplifiers and to hold the output at the desired level in conjunction with their operational amplifier.

3,599,099
SYSTEM FOR TRANSFERRING AUDIO SYSTEM OUTPUT TO PREDETERMINED BROADCAST SIGNAL

Akira Tatebayashi, and Totaro Ogura, both of Tokyo, Japan, assignors to Nippon Broadcasting System, Tokyo, Japan

Filed Feb. 14, 1968, Ser. No. 705,412
Claims priority, application Japan, Feb. 15, 1967, 42/9277
Int. Cl. H04b 1/32
U.S. Cl. 325—311 5 Claims

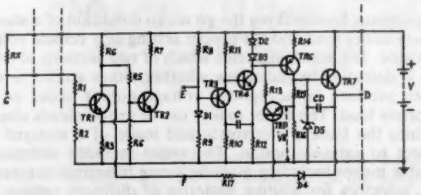


The following specification discloses transmitting and receiving apparatus wherein selected radio programs transmitted from the transmitter have modulated thereon one or more Q signals. The receiver has a first or normal state and a second state wherein it is adapted to receive programs having a selected one of the Q signals modulated thereon. The receiver apparatus is provided with an automatic tuning device for continuously scanning the broadcast band. A carrier wave detector and a Q signal detector are effective to disable the automatic tuning device and to operate a circuit transferring means to switch the receiver from its normal state to its second state, to thus receive the particular program having the Q signal modulated thereon. The receiver returns to its normal state when the Q signal ceases.

3,599,100
BATTERY ECONOMY APPARATUS

Michael H. E. Ward, Cambridge, England, assignor to Pye Limited, Cambridge, England

Filed Nov. 18, 1968, Ser. No. 776,730
Claims priority, application Great Britain, Nov. 30, 1967, 54685/67
Int. Cl. H04b 1/16
U.S. Cl. 325—492 8 Claims

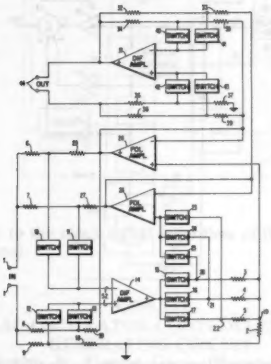


This invention relates to a battery-operated transistor radio receiver incorporating a battery economizer circuit for reducing the power consumption from the battery in the absence of a received signal and including a semiconductor switch device for rendering the direct-current path to the receiver alternately conductive and nonconductive and which is maintained switched on upon receipt of an incoming signal. According to the invention, the semiconductor switch device is so arranged that it also acts as a series-stabilizing element of a substantially constant voltage source derived from the battery and forming the power supply to the receiver. Means are also disclosed for protecting the switch device against damage in the event of a heavy overload on the stabilized voltage supply line to the receiver.

3,599,101
SOLID STATE DIRECT CURRENT TESTER FOR MICROCIRCUITS

John F. Merrill, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,569
Int. Cl. H03k *17/00*
U.S. Cl. 328—97 4 Claims

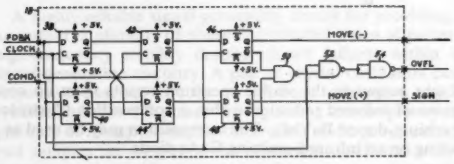


A solid state circuit tester including two difference amplifiers, two follower amplifiers, resistors and solid state switches for providing direct current, direct voltage and load simulation. One of the difference amplifiers is connected in series circuit with a selected one of the resistors and a circuit point to be tested. Negative feedback to the input of the difference amplifier is provided by a selected one of the follower amplifiers which are connected, respectively, to the circuit point to be tested and to the selected resistor. The second difference amplifier is selectively connected to the circuit point to be tested and to the selected resistor for providing an output voltage representing, respectively, the voltage at said circuit point and the current flowing therein.

3,599,102
DIGITAL PHASE DETECTOR

Gerardus A. Mous, Dunton, England, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 26, 1970, Ser. No. 5,509
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 3 Claims

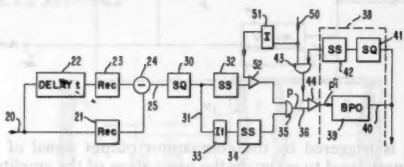


An apparatus for providing a digital output analogous to a phase difference greater than a predetermined magnitude between two asynchronous inputs of the same frequency. After synchronization with an input reference frequency, a pulse width is produced representative of the phase difference between the inputs. The pulse width is reduced by a predetermined magnitude; and a number of pulses is output proportional to the time duration of the new smaller pulse width.

3,599,103
SYNCHRONIZER FOR DATA TRANSMISSION SYSTEM

Henri J. Nussbaumer, La Gaude, and Etienne E. Paris, Nice, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1968, Ser. No. 742,940
Claims priority, application France, Nov. 8, 1967, 8819(AM)
Int. Cl. H03k *5/18*
U.S. Cl. 328—135 4 Claims

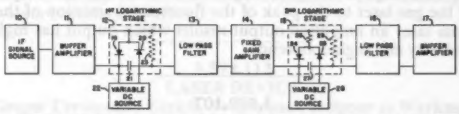


In a transmission system using a signal-phase shift to encode data, the clock for sampling of the signal for data recovery is maintained in phase with the transmitter clock by a detector which indicates the signal positions having the same voltage magnitudes at positions 90° apart in the signal cycle. The sampling clock is controlled to sample the signal at the indicated points thereby enabling other devices to translate the transmitted data.

3,599,104
LOGARITHMIC AMPLIFIER OF EXTENDED DYNAMIC RANGE

William Peil, North Syracuse, N.Y., and Friedrich Szuran, Zug, Switzerland, assignors to General Electric Company

Filed Dec. 30, 1968, Ser. No. 787,832
Int. Cl. H04b *1/04*
U.S. Cl. 328—145 9 Claims



Apparatus is disclosed for logging an input signal over an extended dynamic range. The apparatus has particular application to high frequency, high bandwidth signals. An extended logarithmic range is achieved by using consecutive logarithmic stages, wherein each stage exhibits a linear portion and a logarithmic portion in its transfer characteristic. Each stage is so arranged that successive portions of the dynamic range of the input signal is successively logged. Thus an output signal is generated wherein an extended dynamic range of the input signal is continuously logged. The logging component comprises a semiconductor diode preferably in a symmetrical diode pair configuration.

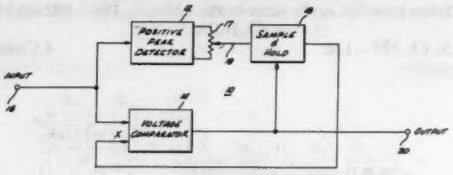
3,599,105
AMPLITUDE DISCRIMINATOR WITH AN ADAPTIVE THRESHOLD

Donald E. Weir, Harbor City, and Thomas D. Wright, Fountain Valley, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 24, 1969, Ser. No. 846,301
Int. Cl. H03k *5/00*, *17/00*
U.S. Cl. 328—146 8 Claims

An amplitude discriminator which includes a peak detector with a fixed selected discharge rate and which charges up to the peak amplitude of a first input signal, and to the peak amplitude of any subsequent input signal, whose peak amplitude exceeds the amplitude of peak detector's output. A selected percentage of the amplitude of the peak detector output is fed to a comparator, which compares the percentage amplitude with the amplitude of each input signal and

provides an output signal of a first binary level only when the amplitude of the input signal is not less than the selected percentage of the peak detector output. An incorporated hold



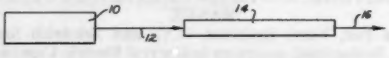
circuit is triggered by the comparator output signal of the first binary level to maintain the percentage of the amplitude of the peak detector output which is supplied to the comparator constant during the comparison duration.

3,599,106

HIGH INTENSITY-HIGH COHERENCE LASER SYSTEM

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 6, 1968, Ser. No. 773,888
Int. Cl. H01s *3/14*
U.S. Cl. 330—4.3 **10 Claims**



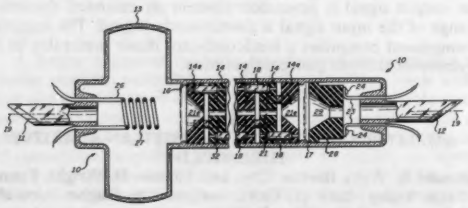
A gas laser oscillator optically coupled to one or more glass laser amplifiers is provided. A high output from the gas laser is optically coupled to the single lowest order mode of the first stage of the glass amplifier. By matching the output of the gas laser to the peak of the fluorescent emission of the glass laser an amplified output results which output has high intensity and high coherence.

3,599,107

THERMALLY COMPENSATED LASER DISCHARGE STRUCTURE

Karl J. Knudsen, East Rockaway, and Robert J. Gartner, Carle Place, both of, N.Y., assignors to Sperry Rand Corporation

Filed Nov. 25, 1968, Ser. No. 778,529
Int. Cl. H01s *3/05*
U.S. Cl. 330—4.3 **6 Claims**



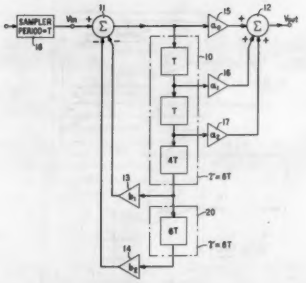
A gas laser including a quartz insulator tube enclosing a stack of graphite discs having a central aperture forming a laser discharge path wherein the individual discs are spatially separated and electrically insulated from one another by quartz rods inserted into spacer holes disposed about the central aperture, the depth of the spacer holes in the discs intermediate the end discs being constructed and arranged in a manner to compensate for thermally induced variations in the length of the stack.

3,599,108

DISCRETE-TIME FILTERING APPARATUS

William A. Gardner, Shutesbury, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 14, 1969, Ser. No. 876,831
Int. Cl. H03h *7/10*
U.S. Cl. 333—70 A **10 Claims**



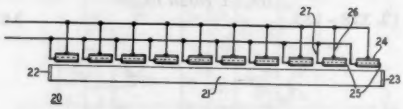
In a discrete-time filter, sensitivity to coefficient variation is substantially reduced by using a unit delay interval, for the delay networks of the filter, which is not equal to the sampling interval. Furthermore, in realizing higher order filter systems, a plurality of such filters may be cascaded, each having a delay interval different from that of the other filters. The periods of repetition of the poles of the overall filter function are therefore different, resulting in improved filter performance.

3,599,109

SECOND PHOTON VISIBLE EMITTING PHOSPHOR AND DEVICE UTILIZING SAME

Howard J. Guggenheim, Somerville, and Leo F. Johnson, Bedminister, both of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1969, Ser. No. 816,734
Int. Cl. H01s *3/16*
U.S. Cl. 331—94.5 **11 Claims**



Light output in the visible spectrum results from up conversion of infrared radiation within a composition illustrated by erbium-doped $BaYbF_5$. The composition may be used as a coating on an infrared-emitting GaAs diode.

3,599,110

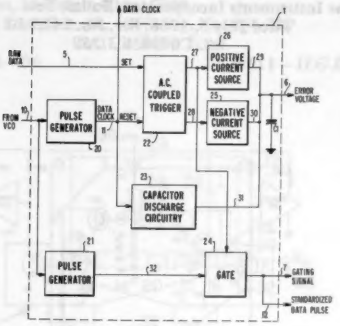
SELF-CLOCKING SYSTEM HAVING A VARIABLE FREQUENCY OSCILLATOR LOCKED TO LEADING EDGE OF DATA AND CLOCK

Abraham M. Gindi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,310
Int. Cl. H03b *3/06*
U.S. Cl. 331—10 **6 Claims**

The invention relates to a self-clocking system having a variable frequency oscillator which corrects for changes in

frequency and phase between a data signal and a clock signal, such that the data signal will have the same phase



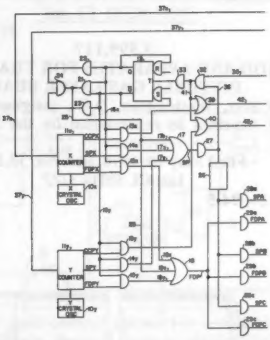
relationship to the clock signal regardless of the frequency of the data signal.

3,599,111

CRYSTAL-OSCILLATOR-CONTROLLED SIGNAL-GENERATING CIRCUIT

Luther C. Butler, Jr., Garden Grove; Thomas W. Grasmehr, Costa Mesa, Calif., and Robert S. Jamieson, assignors to Lorain Products Corporation, Lorain, Ohio

Filed Feb. 5, 1970, Ser. No. 8,770
Int. Cl. H03b *3/00*
U.S. Cl. 331—55 **23 Claims**



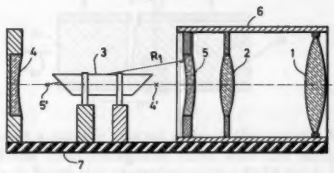
A highly reliable signal-generating circuit for providing, at an output, a plurality of phase-coordinated trains of pulses of high-frequency stability despite circuit failures within the signal-generating circuitry. A pair of crystal oscillators cause respective counter circuits to produce responsive sets of synchronism control pulses for regulating the frequency of a plurality of relaxation oscillator circuits. A clock selector circuit samples the output of the relaxation oscillators and, in accordance therewith, determines which counter circuit shall be utilized to supply synchronism control pulses to the relaxation oscillators. Corrective circuitry brings the nonselected counter circuit into synchronism with the selected counter circuit so that the former may be substituted for the latter if the latter fails to properly control the relaxation oscillator circuits. Phase control circuitry assures that necessary corrective activity occurs at times when such activity will not cause transient changes in the frequency of output pulses. Circuitry is provided to suppress the outputs of both counter circuits upon the occurrence of predetermined circuit failures. Under the latter conditions the output is maintained on an emergency basis by the relaxation oscillators.

3,599,112

LASER HAVING A TELESCOPIC SYSTEM RELATED TO THE OUTPUT REFLECTOR TO KEEP THE DIRECTION OF THE OUTPUT BEAM CONSTANT

Eberhard Holtz, Aachen, Germany, assignor to Carl Zeiss-Stiftung, Heidenheim on the Brenz, Wurttemberg, Germany

Filed Mar. 27, 1970, Ser. No. 23,414
Claims priority, application Germany, Mar. 28, 1969, P 19 15 890.8
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **7 Claims**



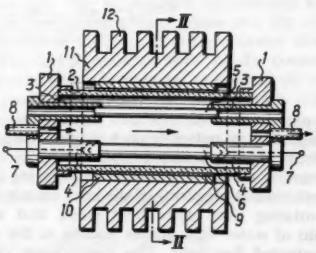
Apparatus for generating a laser beam in a constant spatial direction by a laser tube between a spherical resonator reflector and a spherical semipermeable tune-out reflector, includes a telescopic system, consisting of an objective lens and an ocular lens, rigidly mounted in optical axial alignment with the tune-out reflector. The focal point of the combination of the tune-out reflector and telescopic system coincides with center of curvature of the front surface of the tune-out reflector. In a preferred form the radius of curvature of the surface of the output side of the tune-out reflector is in accordance with the formula $R_3=(R_1+d)\times 1-7/n$, R_1 being the radius of the front surface, d the thickness at the axis and n the index of refraction of the tune-out reflector. In one form a horizontalizing compensator is included between the ocular and objective lens of the telescopic system. Preferably the tune-out reflector and the telescopic system and the resonator reflector and the laser tube are mounted in operative relation so as to be thermally separated. The telescopic system is preferably afocal.

3,599,113

LASER DEVICE

Gregor Cremosnik, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Apr. 8, 1970, Ser. No. 26,566
Claims priority, application Switzerland, Apr. 25, 1969, 6293/69
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **6 Claims**

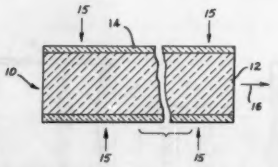


A laser device with a glass tube of elliptical cross section. A laser rod and a rod-shaped light source are each located on a line passing through a respective focus of the ellipse parallel to the longitudinal axis of the glass tube. A reflecting film covers the outer surface of the glass tube, and a protective film of thermally conductive material covers the reflective film. A metal body having cooling fins surrounds the the outer surface of the protective film. A coolant such as water is passed through the glass tube and the refractive index of the coolant is substantially equal to that of the glass in the tube.

3,599,114
LASER CONSTRUCTIONS

Elias Snitzer, Wellesley, Mass., and Richard F. Woodcock, Woodstock, Conn., assignors to American Optical Corporation, Southridge, Mass.

Filed Apr. 30, 1968, Ser. No. 725,378
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 4 Claims

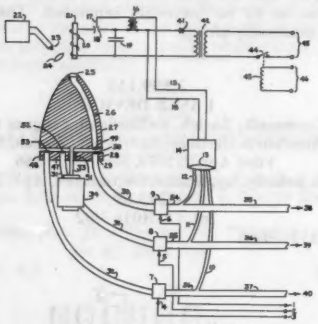


Laser construction employing an elongated core of preselected laser glass including erbium as an active ion therein and a cladding of selectively absorbing material including praseodymium in surrounding relation to said core for providing coherent laser emission substantially at 1.5 microns wavelength and at high operating efficiency.

3,599,115
LASER SEQUENCING

Dale L. Beezley, P. O. Box 41, Los Altos, Calif.

Filed July 8, 1968, Ser. No. 743,146
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 1 Claim

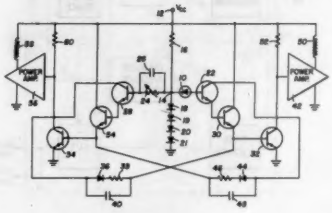


The present invention relates to the time sequencing of laser high energy pulses from a single lasing source into a multiplicity of laser actuated functions. In the embodiment of the invention disclosed, the time sequencing is achieved by the synchronized triggering of the laser source into a continuously rotating fiber optic light guide that sweeps past a manifold of stator light guides leading to the multiplicity of laser actuated functions. The coincidence of the rotating light guide's axis with the axis of a particular stator light guide's axis concurrently with the condition of a light shutter, between the stator and a particular laser actuated function, being open, results in a low-level trigger light from the rotor energizing the trigger circuits of the laser source, this action occurring so rapidly that the laser source lases into the fiber optics, passing higher level laser energy into the laser actuated function designated by the shutter actuation. Thus is achieved any sequencing pattern desired without the acceleration-deceleration forces (hence, unreliability) in a stepping motor, while achieving perfect synchronization and alignment of the rotor light guide with the stator light guides.

3,599,116
LIGHT SENSITIVE SIGNAL GENERATOR

Hilton W. Spence, Richardson; Ralph O. Bohannon, Richardson, and Edward N. Jeffrey, Plano, all of, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 5, 1968, Ser. No. 742,730
Int. Cl. H03k 3/282
U.S. Cl. 331—113 R 4 Claims

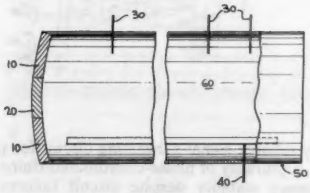


A circuit for producing an electrical signal proportional to light intensity having two amplifiers interconnected in a multivibrator configuration. The timing circuit of one amplifier is a standard RC circuit and in the second a photodiode. In one configuration, the amplifiers including associated transistors, resistors and capacitors along with a light sensitive diode are fabricated as an integrated circuit on a monolithic substrate. Because the device responds to light in the visible range which is absorbed close to the incident surface of silicon, the diffused diode must be as thin as possible to obtain the desired high light current. A process for fabricating the light sensitive diode and associated circuitry includes the step of a dilute deposition of phosphorous oxytrichloride for the transistor emitter. Special processing techniques are employed to minimize thermal shock and dislocations.

3,599,117
METHOD AND APPARATUS FOR TRACKING AN INVISIBLE GAS LASER BEAM

Colin S. Willett, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army

Filed May 18, 1970, Ser. No. 38,160
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 19 Claims



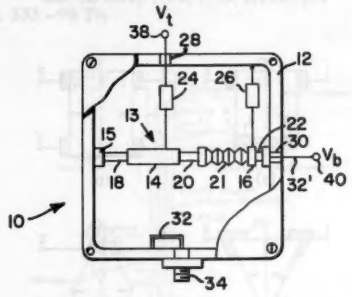
Method and apparatus for tracking an invisible gas laser beam. A superradiant transient-type laser material is added to a gas laser such as the CO_2-far infrared laser and the combination is excited by extremely fast rise-time excitation pulses that induce laser emission in both the CO_2 and the superradiant additive to produce a dual simultaneous emission. If the superradiant material is one whose stimulated emission falls within the visible spectrum, it will provide a visible tracer for the invisible 10.6 micron CO_2-laser beam. The superradiant additive can also be chosen so that its wavelength falls just outside the visible spectrum where good detectors or image intensifiers are available, thus improving greatly the detection means normally available for the CO_2-laser beam alone. A compound mirror can be utilized at one end of the gas laser cavity for enhancing the oscillations of both lasing materials.

3,599,118

VARACTOR TUNED NEGATIVE ASSISTANCE DIODE MICROWAVE OSCILLATORS

David J. Large, Sunnyvale, Calif., assignor to Kruse-Storke Electronics, Mountain View, Calif.

Filed Oct. 16, 1969, Ser. No. 866,919
Int. Cl. H03b 7/14
U.S. Cl. 331—96 2 Claims



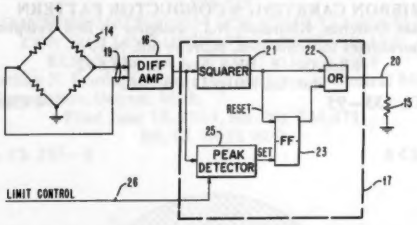
A varactor tuned oscillator circuit comprising an outer conductor of a TEM line and an inner conductor comprised of varactor means in series with an active two terminal solid state power generation device driving the line.

3,599,119

AMPLITUDE CONTROL CIRCUIT FOR RESONISTOR OSCILLATOR

William G. Crouse, and Phillip R. Epley, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1969, Ser. No. 828,906
Int. Cl. H03b 5/36
U.S. Cl. 331—116 3 Claims



An automatic gain control circuit for a resonistor, i.e., a mechanical oscillator, formed from a single silicon crystal, can be diffused directly into the crystal. The circuit requires no phase reactive components and the entire oscillatory unit can be fabricated by monolithic circuit techniques.

ERRATUM

For Class 332—23 see:
Patent No. 3,599,237

3,599,120

DOUBLE HELIX MICROWAVE STRUCTURE FOR COUPLING A MICROWAVE MAGNETIC FIELD FROM A FIRST TO A SECOND REGION

Ronald M. Thibault, Franklin Park, and Dale W. Schutt, So. Bend, both of, Ind., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 7, 1969, Ser. No. 864,480
Int. Cl. H01p 5/00
U.S. Cl. 333—24 R 1 Claim

The device comprises a first helix, a second helix and a stem structure interconnecting the first and second helices. The first helix of the device is inserted into a resonant cavity of a microwave spectrometer to couple the microwave magnetic field therein, via the stem structure, to the second helix

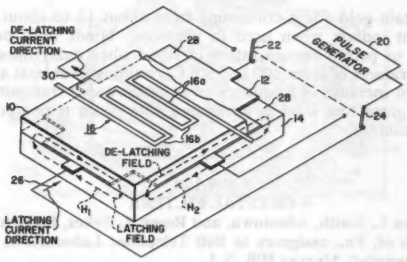
mounted about a sample placed outside the cavity. After interaction of the electromagnetic field with the sample, the second helix reflects the electromagnetic field back into the cavity, via the stem structure and the first helix.

3,599,121

MICROSTRIP LATCHED FERRITE PHASE SHIFTER WHEREIN LATCHING PULSES PASS THROUGH GROUND PLANE

Daniel C. Buck, Hanover, Md., and Aleksander I. Braginski, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1970, Ser. No. 26,199
Int. Cl. H01p 1/18, 1/32
U.S. Cl. 333—31 R 9 Claims



A latching ferrite phase shifter for microstrip transmission lines compatible with integrated circuits and incorporating two ferrite materials, one of which is sandwiched between the transmission line and a ground plane and the other of which is on the side of the ground plane opposite the transmission line. The ferrite material between the transmission line and the ground plane is designed to control the amount of phase shift produced by the phase shifter; while the other ferrite material on the side of the ground plane opposite the transmission line is isolated from microwave frequencies but forms a magnetic circuit with the first and has a coercive force and saturation magnetization much greater than that of the first to hold it in a magnetized state above its remanent point.

3,599,122

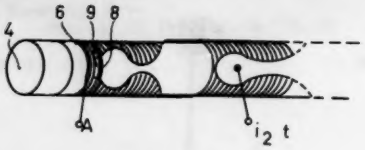
FILTER NETWORK INCLUDING AT LEAST ONE TAPPED ELECTROMAGNETIC DELAY LINE

Peter Leuthold, Erlenbach, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,999
Claims priority, application Switzerland, Oct. 10, 1968, 15170/68
Int. Cl. H03h 7/34
U.S. Cl. 333—29 10 Claims

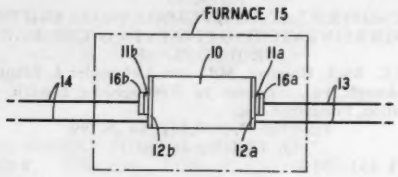
A delay line for use in a filter has a strip or coil conductor continuously coupled to the conductor. The conductor has a

longitudinally varying impedance such as resistance, capacitance, or inductance. This is achieved by varying the



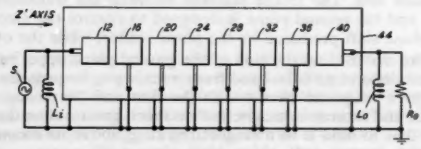
thickness, width, or pitch of the conductor, so that many transfer functions can be synthesized.

3,599,123
HIGH TEMPERATURE ULTRASONIC DEVICE
John T. Krause, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 24, 1969, Ser. No. 860,821
Int. Cl. H03h *7/38*
U.S. Cl. 333—30 R **2 Claims**



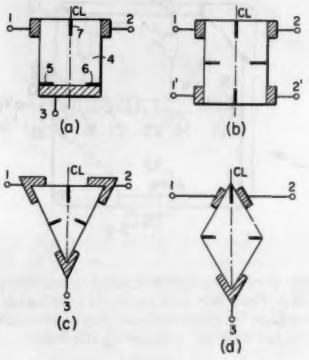
Certain gold alloys containing from about 12 to about 67 percent indium when used in ultrasonic bonds have been found to permit the operation of fused silica delay lines at temperatures of from 200 to 550° C. resulting in at least a 50 percent increase in frequency of acoustic waves transmitted for a given loss level as compared with room temperature operation.

3,599,124
CRYSTAL FILTERS
Warren L. Smith, Allentown, and Roger A. Sykes, Bethlehem, both of, Pa., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed Apr. 24, 1968, Ser. No. 723,677
Int. Cl. H03h *9/20, 7/38*
U.S. Cl. 333—72 **2 Claims**



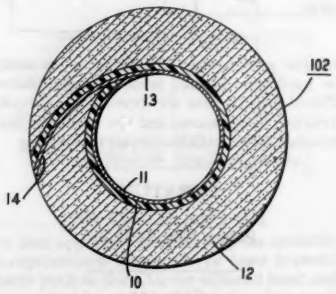
Three or more resonator-forming electrode pairs and a crystal wafer on which they are mounted, form a multiresonator crystal filter with respective inductors connected to two of the pairs. The electrode pairs have masses such as to tune the frequency exhibited by the unconnected resonator to a frequency f_p. The inductors tune the interelectrode capacitances of the connected resonators to the frequency f_p. The masses of electrodes in the connected resonators tune the mechanical resonance of the crystal between the electrodes to the frequency f_p. The electrode spacings in view of their masses are such as to achieve predetermined couplings between resonators.

3,599,125
THIN FILM RESISTANCE ATTENUATOR
Nobuyoshi Yoshida, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Nov. 3, 1969, Ser. No. 873,605
Claims priority, application Japan, Nov. 4, 1968, 43/80842
Int. Cl. H01p *1/22, 7/00*
U.S. Cl. 333—81 R **5 Claims**



A thin film resistance attenuator comprises more than two band-shaped insulation regions or band-shaped conduction regions selectively provided therein. The lengths of these regions are adjusted whereby the characteristic impedance and attenuation value of the attenuator are independently adjusted.

3,599,126
CIRCULAR WAVEGUIDE FORM FROM A FLEXIBLE RIBBON CARRYING A CONDUCTOR PATTERN
Nicholas Osifchin, Kinnelon, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray hill, N.Y.
Filed Oct. 8, 1969, Ser. No. 864,662
Int. Cl. H01p *11/00, 3/12*
U.S. Cl. 333—95 **4 Claims**



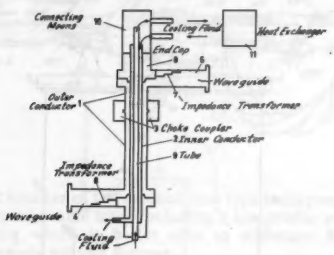
Circular waveguide is formed from a flexible wiring carrier or ribbon. An appropriate conductor pattern is printed on a dielectric ribbon, such as mylar tape, to form the ribbon. The ribbon may also contain layers of lossy material on one side, thereof. The ribbon is continuously wrapped transversely about a mandrel to form a longitudinal seam. The wrapped ribbon is drawn from the mandrel, cured, and encased with a protective sheath. Various types of circular waveguide, such as spaced-ring helix or solid waveguides, each having the option of a dielectric lining, may be fabricated by the same principles.

3,599,127

ROTARY WAVEGUIDE JOINTS HAVING A LIQUID TRANSPORT SYSTEM

Jacobus Willem Hendrik Krijger, Borne, Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo, Overijsel, Netherlands

Filed Mar. 17, 1969, Ser. No. 807,826
Claims priority, application Netherlands, Mar. 20, 1968, 6803914
Int. Cl. H01p 1/06, 1/30; H01b 7/34
U.S. Cl. 333—98 TN 5 Claims



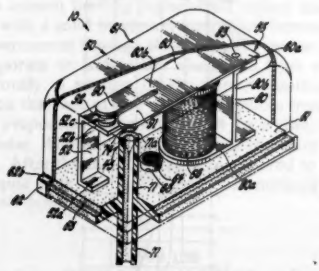
The invention relates to a rotary waveguide joint comprising a coaxial line having an outer conductor divided into a fixed lower part and an upper part which is rotatable with respect to said lower part which is rotatable with respect to said lower part about a fixed hollow inner conductor, a choke-coupler and two rectangular waveguides, which are connected to the end portion of said upper and lower part respectively in a direction at right angles to said coaxial line. The inner conductor contains a tube through which a cooling liquid is forced upwards, while the cooling liquid is carried off downwards through the space between the inner conductor and said tube. Said cooling liquid is conveyed to a heat exchanger located on a rotating platform.

3,599,128

CONTROL MECHANISM FOR SIMULTANEOUSLY CONTROLLING OPERATION OF FLUID AND ELECTRICALLY OPERATED DEVICES

Jonathan N. Fruth, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 18, 1969, Ser. No. 834,471
Int. Cl. H01h 9/00
U.S. Cl. 335—1 6 Claims



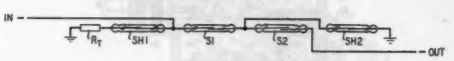
In a preferred form, a control mechanism for simultaneously controlling operation of an electrically driven blower and a pneumatically actuatable air vent for controlling admission of fresh air to the blower of a comfort control system of an automotive vehicle is disclosed. The control mechanism comprises an electromagnetic relay means carried by a housing and which includes a bifurcated armature which functions both as a switch and a valve actuator for controlling energization of the electrically driven blower and for controlling operation of the pneumatically actuatable fresh air vent control.

3,599,129

COAXIAL CABLE SWITCH

Frank J. Arvay, Scotch Plains, and Robert A. Sutton, Fanwood, both of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1969, Ser. No. 878,521
Int. Cl. H01h 51/27
U.S. Cl. 335—5 5 Claims



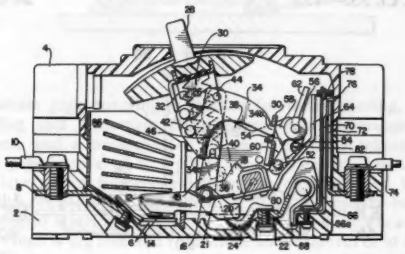
A high isolation coaxial cable switch is formed by employing a pair of serially connected sealed reed switches with the conducting path between the switches connectable to ground through a third reed switch. The serial switches are make contacts and the ground path switch is a break contact. All switches are operated simultaneously.

3,599,130

CIRCUIT INTERRUPTER

Wasaburo Murai, and Kiyoshi Hiroi, both of Osaka, Japan, assignors to Terasaki Denki Sangyo, Kabushiki, Kaisha, Osaka, Japan

Filed July 10, 1969, Ser. No. 840,728
Claims priority, application Japan, July 15, 1968, 43/48,999
Int. Cl. H01h 73/48
U.S. Cl. 335—43 1 Claim



A circuit interrupter comprises a trip plate including a stop for limiting the stroke of a movable contact arm.

Upon an excessive current flow the interrupter a bimetal and/or an electromagnet causes the trip plate to be moved in such a direction that the movable contact is separated from the stationary contact by a distance greater than that provided by the normal opening operation.

3,599,131

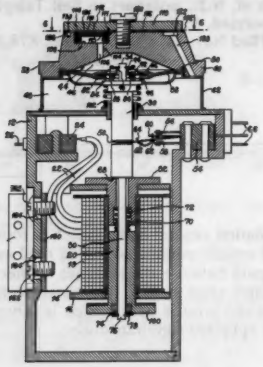
TIMING DEVICE WITH PNEUMATIC DELAY MEANS

Robert M. Flanagan, and Glenn W. Johnson, Jr., both of Summit, N.J., assignors to Amerace Esna Corporation, New York, N.Y.

Filed Feb. 26, 1969, Ser. No. 802,546
Int. Cl. H01h 7/03
U.S. Cl. 335—61 14 Claims

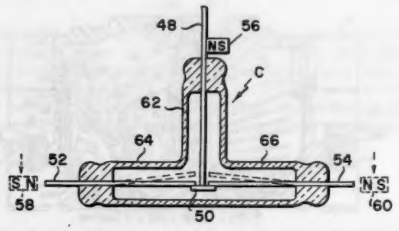
A pneumatic timing device in which a timing head includes an air chamber, a diaphragm is movable relative to the timing head to effect a change in the volume of the air chamber and establish a flow of air into or out of the air chamber, a timing member is coupled for movement with the diaphragm at a rate determined by the rate of flow of air to or from the air chamber, a passage in the timing said head communicates with the air chamber for conducting the flow of air, a body of porous material is in the passage for throttling the flow to a predetermined maximum rate of flow, the body of porous material having a surface of prescribed area through which the airflow passes, and a shutter is in close engagement with the surface of the body of porous material and includes a

relatively nonporous member selectively movable along the surface relative to the body to close off at least portions of



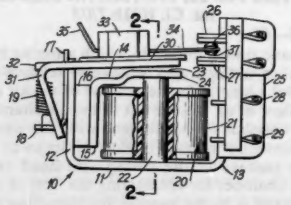
the area to the airflow for selectively varying the rate of the flow to regulate the rate of movement of the timing member.

3,599,132
PERMANENTLY POLARIZED REED SWITCH
Edward Shlesinger, Jr., 3906 Bruce Lane, Annandale, Va.
Continuation-in-part of application Ser. No. 669,614, Sept. 21, 1967, now Patent No. 3,447,105, dated May 27, 1969. This application Aug. 2, 1968, Ser. No. 749,737
Int. Cl. H01h *51/22, 51/28*
U.S. Cl. 335—153 **24 Claims**



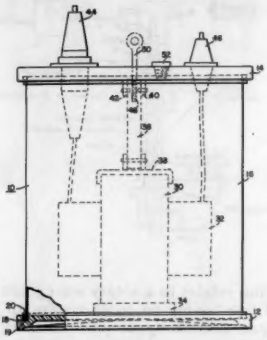
A reed switch comprising a permanently polarized reed; at least two temporarily polarizable reeds; one of the polarizable reeds which when not polarized being in contact with the permanent polarized reed; and the one of said polarizable reeds when polarized being out of contact with the permanent polarized reed.

3,599,133
LATCH RELAY MOTOR STRUCTURE
Walter J. Richert, Princeton, Ind., assignor to AMF Incorporated
Filed Mar. 10, 1970, Ser. No. 18,054
Int. Cl. H01f *7/08*
U.S. Cl. 335—230 **8 Claims**



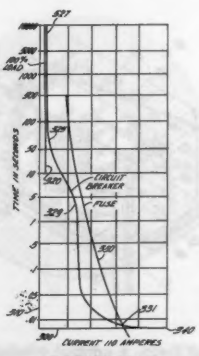
A clapper-type magnetic latch relay with electromagnetic operating means having a remanent magnet core with one end surface coupled with an optimum pole face area on one side of an air gap without sacrificing core diameter and coil winding relationship.

3,599,134
NONMETALLIC CORROSION-RESISTANT ENCLOSURE FOR ELECTRICAL APPARATUS
Dudley L. Galloway, Sharpsville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 25, 1970, Ser. No. 22,477
Int. Cl. H01f *27/02*
U.S. Cl. 336—90 **6 Claims**



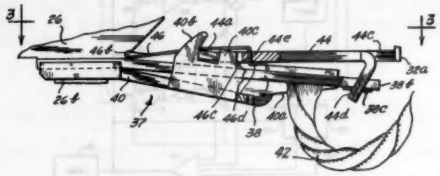
A nonmetallic corrosion-resistant enclosure for electrical apparatus comprising an outer housing or casing made from rubber or plastic material which will not deteriorate or corrode and develop leaks when exposed for an extensive period of time in a high moisture content environment.

3,599,135
CIRCUIT PROTECTION ARRANGEMENT INCLUDING COORDINATED OPERATION OF A CIRCUIT BREAKER AND A CURRENT LIMITING FUSE
Carl E. Gryctko, Haddon Heights, N.J., assignor to I T E Imperial Corporation, Philadelphia, Pa.
Continuation of application Ser. No. 647,999, June 22, 1967, now abandoned. This application Jan. 12, 1970, Ser. No. 1,958
Int. Cl. H01h *73/50, 85/54*
U.S. Cl. 337—6 **9 Claims**



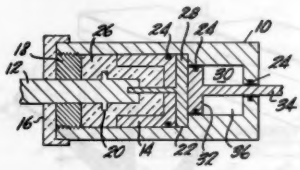
A circuit protective arrangement which utilizes a circuit breaker and current limiting fuse to achieve reliable current interruption when connected to a source having an available current in excess of the rated current interruption rating of the circuit breaker. The source voltage is above the rated voltage of the circuit breaker device, as well as above the rated voltage of the fuse. A compact unitized structure for the circuit breaker and current limiting fuse is also shown for both single phase and multiphase installations.

3,599,136
MOLDED-CASE CIRCUIT BREAKER HAVING IMPROVED OVERCURRENT RELEASABLE LATCH
John DeTorre, and Henry S. Wingard, both of Albemarle, N.C., assignors to Federal Pacific Electric Company
Filed July 28, 1969, Ser. No. 845,274
Int. Cl. H01h 71/16, 71/64; H01b 75/12
U.S. Cl. 337—71 4 Claims



A circuit breaker of the molded case type incorporating an overcurrent releasable latch including a low-profile armature return spring which is better able to withstand hot arc-generated gasses without damage.

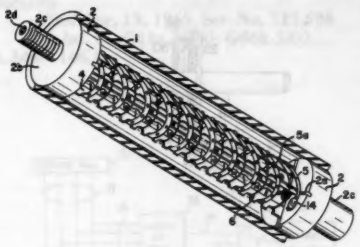
3,599,137
CURRENT LIMITING DEVICE
Toshio Ito; Toshio Miyamoto, and Yuichi Wada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed July 1, 1969, Ser. No. 838,238
Claims priority, application Japan, July 5, 1968, July 5, 1968, 43/46884;43/46887
Int. Cl. H01h 85/06
U.S. Cl. 337—21 8 Claims



Two opposite electrodes electrically interconnected through a current limiting material are united into a unitary structure with a solid insulation interposed between them. A flow of overcurrent through the electrodes causes the material to evaporate to isolate the electrodes from each other. Simultaneously, a portion of the current limiting material disposed on that side of one electrode remote from the other electrode evaporates to move a piston for a compressed gas-filled cylinder. Alternatively, the unitary structure can act as the piston. After the material has been restored to its original solid or liquid state, the moved parts automatically return to their original positions.

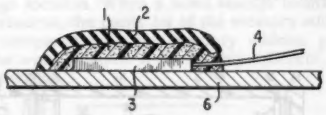
3,599,138
HIGH-VOLTAGE FUSE
Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.
Filed Nov. 13, 1969, Ser. No. 876,445
Int. Cl. H01h 85/08, 85/14
U.S. Cl. 337—159 5 Claims

A high voltage fuse with a helically wound fuse link includes an arc-extinguishing filler of quartz sand and a low thermal conductivity arc-extinguishing filler, both fillers having an interface. The low thermal conductivity filler is so densely packed as to preclude mixing of the fillers. The helically wound fuse link is supported by insulating plates parallel to the axis of the fuse casing having axially outer edges engaging grooves formed in the axially inner end surfaces of a pair of terminal plugs closing the axially outer ends of the



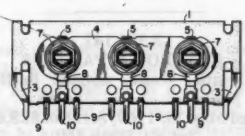
fuse casing. The terminal plugs are provided on the outer end surfaces thereof with coaxial multifunction projections.

3,599,139
STRAIN GAGE PROTECTIVE COVER
Malcolm E. Low, Annisquam, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.
Filed Mar. 14, 1969, Ser. No. 807,169
Int. Cl. H01c 1/02
U.S. Cl. 338—2 10 Claims



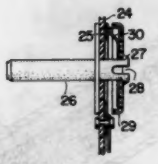
A strain gage covering, a method for waterproofing, salt-proofing and protecting strain gages from environmental stresses, and a protected strain gage assembly wherein a strain gage is covered by a plural layered laminated having a first layer of a rubberlike elastomer, characterized by a modulus of elasticity of less than 10^7 p.s.i., adhesively bound to a second layer of a soft, compliant, moldable hydrocarbon resin which is sag free and resilient at temperatures of at least 180° F.

3,599,140
VARIABLE RESISTOR DEVICE PROVIDED WITH A PLURALITY OF VARIABLE RESISTORS
Katsumi Ichikawa; Heiroku Tanaka, and Katsuyoshi Onda, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 1, 1969, Ser. No. 846,905
Claims priority, application Japan, Aug. 6, 1968, Aug. 6, 1968, Aug. 6, 1968, Aug. 6, 1968, Oct. 17, 1968, 43/68110; 43/68111; 43/68112; 43/68116; 43/92303
Int. Cl. H01c 9/02
U.S. Cl. 338—128 4 Claims



A semifixed, gang and print type variable resistor which is economical and used mainly with a color television set at its

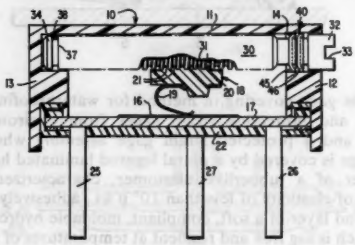
reverse side and in which a plurality of variable resistor elements can readily be fitted on a single insulating base plate.



3,599,141
VARIABLE RESISTOR HAVING MEANS FOR SEALING BETWEEN A LEAD SCREW AND THE HOUSING

Bradrick A. Hildreth, Huntington Beach, and Robert D. Hill, Jr., West Covina, both of, Calif., assignors to Spectrol Electronics Corporation, City of Industry, Calif.

Filed July 7, 1969, Ser. No. 839,348
Int. Cl. H01c *9/02*
U.S. Cl. 338—180 **5 Claims**



A potentiometer having a closed casing in which is disposed a resistance element, a wiper element, and a helically threaded, axially extending lead screw member. A plurality of frustoconical, radially extending, integral, resilient plastic sealing ribs are provided about a reduced diameter portion of the lead screw. A cylindrical aperture is formed in one end wall of the housing having a cylindrical interior surface against which the annular sealing ribs are resiliently engaged and deformed for inhibiting the entrance of foreign matter into the housing.

ERRATA

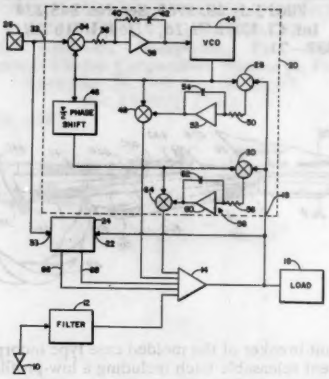
For Classes 339—4, 339—125 see:
Patent Nos. 3,599,164 thru 3,599,174

3,599,142
CONTROL APPARATUS

Stanley Rust, Seattle, Wash., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed May 28, 1969, Ser. No. 828,677
Int. Cl. H04b *1/10*
U.S. Cl. 340—5 R **12 Claims**

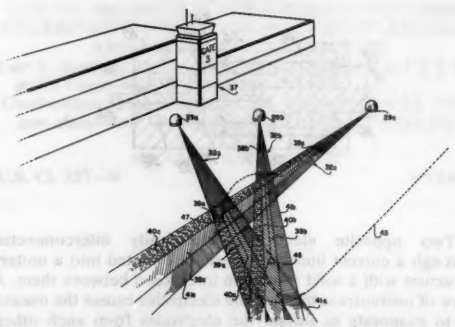
A method and apparatus for providing subtraction of self-generated interference signals through the use of an interference sensor mounted on board a vessel receiving sonar signals. One or more phase lock loops are used to follow each particular self-generated frequency signal. The phase lock loops incorporate amplitude and phase scaling to account for the continual change in both amplitude and phase of a signal between the time of generation and the time of reception by a sonar receiver.



3,599,143
VISUAL SURFACE GUIDANCE APPARATUS

Albert D. Brown, Atlanta, Ga., and William H. Tygart, Marietta, Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Feb. 7, 1968, Ser. No. 703,589
Int. Cl. F21q *3/00*
U.S. Cl. 340—26 **4 Claims**



Guidance apparatus providing lateral and longitudinal visual guidance information to the operator of an aircraft or other vehicle to facilitate vehicular surface maneuvering. A light projection apparatus and a filter provide several multicolor laterally disposed beam segments to provide course guidance and also provide a longitudinal guidance beam portion positioned either above or below the laterally disposed segments to be undershot or overshot by the line of vision of the vehicle operator.

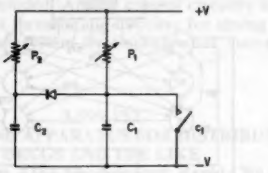
3,599,144
GREEN EXTENSION CIRCUIT FOR TRAFFIC CONTROL

Jean Dressayre, Orsay, France, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 787,046
Claims priority, application France, Dec. 21, 1967, 133350
Int. Cl. G08g *1/08*; H02j *5/00*
U.S. Cl. 340—31 **5 Claims**

A self-adaptive traffic light control system for varying the green light period as a function of the traffic volume. The system employs a first resistor and a first capacitor serially

connected across a DC voltage source and a second resistor and a second capacitor also serially connected across said source. The first series circuit has a lower RC time constant than the second series circuit. The junction points of each series circuit are interconnected by a diode. The first capacitor is discharged at the start of a green light period and is rapidly



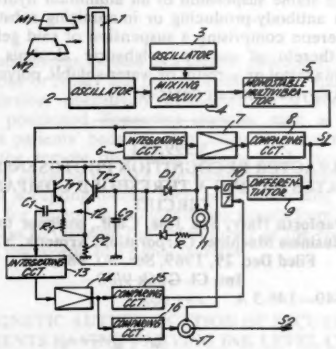
discharged each time a vehicle passes a sensing device in the road. The second capacitor is charged at a low constant rate which is not changed for high volume traffic. When the traffic is light, the first capacitor is allowed to charge up rapidly and, by means of the diode, acts upon the second capacitor to reduce its charge time and thus reduce the total green light period.

3,599,145

SINGLE ELEMENT PLURAL LANE DETECTOR

Hironobu Ando, Kyoto, and Tamotu Sugimoto, Osaka, both of, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed July 29, 1968, Ser. No. 748,246
Claims priority, application Japan, Aug. 17, 1967, 42-52834
Int. Cl. G08g *1/01*
U.S. Cl. 340—38 L **5 Claims**



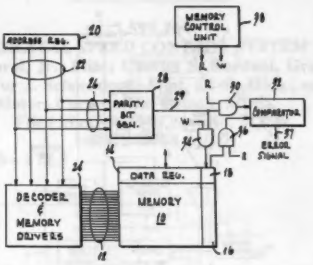
An apparatus for simultaneously detecting vehicles on a plurality of lanes of a street with a single detecting element. The single detecting element is dimensioned to extend across a plurality of lanes of a street and is included in an oscillating circuit, the frequency of which is changed by the presence of a vehicle within the field of the detecting element. When a first vehicle comes into the detecting field, an electrical signal corresponding to the change caused by the vehicle in the frequency is produced to indicate the detection of the first vehicle. At the same time, the value of the electrical signal is memorized. Under this condition, when a second vehicle is detected along with the first, a greater change occurs in the frequency and a corresponding electrical signal is produced. This signal is then compared with the memorized signal to produce an electrical signal corresponding to the difference therebetween, by which the detection of simultaneous presence of the two vehicles is indicated.

3,599,146

MEMORY ADDRESSING FAILURE DETECTION

Joseph A. Weisbecker, Cherry Hill, N.J., assignor to RCA Corporation

Filed Apr. 19, 1968, Ser. No. 722,588
Int. Cl. G11c *29/00*; G06k *5/00*
U.S. Cl. 340—146.1 **1 Claim**



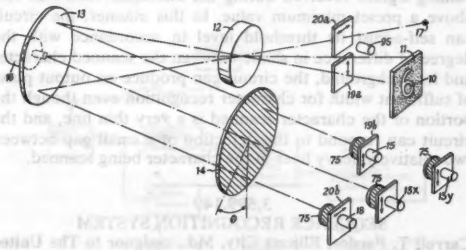
A system for detecting errors in the operation of a random access memory which is particularly useful in memories employing semiconductor decoder elements and semiconductor memory elements. Each word storage location in the memory contains a memory address parity bit for the address of that word storage location. When a word storage location is accessed for readout, the parity bit of the memory address employed is compared with the memory address parity bit stored in the word location. If the bits are different, an error signal is generated.

3,599,147

CHARACTER RECOGNITION SYSTEMS AND APPARATUS

Gordon Leonard Rogers; Ian Leifer, and Noel W. F. Stephens, all of Gosta Green, Birmingham, England, assignors to National Research Development Corporation

Filed Sept. 11, 1968, Ser. No. 758,969
Claims priority, application Great Britain, Sept. 12, 1967, Mar. 26, 1968, 41,641/67;14,443/68
Int. Cl. G06r *9/08*
U.S. Cl. 340—146.3 **31 Claims**



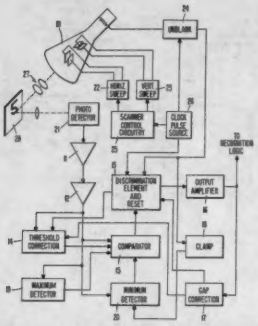
Method of and apparatus for effecting recognition of patterns, especially written or printed characters in which a representation of the pattern in incoherent light, moving electrons or other charged particles is caused to cast shadows of a grating on to a plurality of photoelectric or equivalent sensing devices thereby to derive a number of electric signals representing respectively different Fourier coefficients of one or more spatial frequency components of the pattern and in which such derived signals are comparatively examined in logical circuit means to derive an output signal identifying the pattern.

3,599,148

QUANTIZING CIRCUIT CORRECTION FOR CHARACTER RECOGNITION SYSTEMS

David M. Stern, Merion Station, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 22, 1969, Ser. No. 818,285
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 R **8 Claims**



This disclosure relates to a character recognition system having a quantizing circuit which employs a tunnel diode as a discrimination element. This element is adapted to be triggered to produce an output pulse in response to a varying voltage signal generated during the scan of the character. Means are provided to adjust the bias of the discrimination element so that it may have either two stable states or one stable state respectively corresponding to a storage mode and a tracking mode. The condition determining the mode of operation of the discrimination element is the output signal of the quantizing circuit such that, if the circuit has produced an output signal indicating the detection of a portion of a character during the previous clock period, then, the discrimination element will be placed in the tracking mode during the current clock period. If the circuit has produced no output signal during the previous clock period, then, the discrimination element will be placed in the storage mode. Means are provided to vary the threshold level at which the discrimination element is triggered which variation is a function of the previous maximum and minimum input signals received and also to shift that threshold level to detect the incoming signals received during the character scan that rise above a preset minimum value. In this manner, the circuit can self-adjust its threshold level in accordance with the degree of difference in shade between the scanned character and its background, the circuit can produce an output pulse of sufficient width for character recognition even though the portion of the character scanned is a very thin line, and the circuit can respond to the detection of a small gap between two relatively heavy lines in the character being scanned.

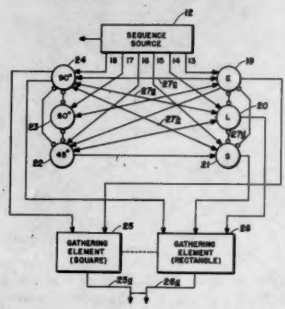
3,599,149

SEQUENCE RECOGNITION SYSTEM

Carroll T. Pardoe, Ellicott City, Md., assignor to The United States of Aermica as represented by the Secretary of the Navy

Filed Apr. 9, 1969, Ser. No. 814,561
Int. Cl. G06k *9/00, 11/02*
U.S. Cl. 340—146.3 S **13 Claims**

An incoming sequence of events is detected by the average excitability level of event recognizing circuit elements which are interconnected so as to form one closed loop for each sequence in the system repertoire. As each recognizer element in a particular loop is triggered by an incoming event, it increases or decreases the excitability of the other recognizer elements in the system depending upon whether or not the other recognizer elements may be triggered next for some particular sequence. A plurality of gathering circuit elements are provided and each is assigned to a different sequence in the system repertoire and each has inputs from the event recognizer elements corresponding to the events in the associated sequence. Each gathering element generates an analog output signal indicating whether or not all of its inputs have been excited during the preceding N command inputs and, if so, what was the average level of excitation. The output analog voltages from all of the gathering elements are then compared against one another to produce an output signal indicating which of the gathering elements has produced the largest magnitude analog output signal; i.e., which sequence in the system repertoire is nearest to the incoming sequence of events under investigation.



3,599,150

STABILIZED ALUMINUM HYDROXIDE SUSPENSIONS

Joseph George Feinberg, London; Alan Philip Fosker, Buckinghamshire, and Patrick James Mill, Buckinghamshire, all of, England, assignors to Miles Laboratories Incorporated, Elkhart, Ind.

Filed Aug. 1, 1969, Ser. No. 846,966
Int. Cl. A61k *23/00;* **C12k** *5/00*
U.S. Cl. 424—88 **9 Claims**

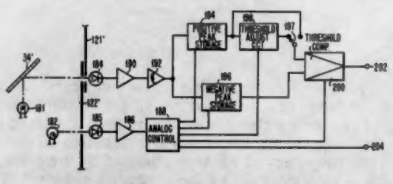
A freeze stable suspension of an aluminum hydroxide gel having an antibody-producing or immunizing substance adsorbed thereon comprising a suspension of said gel and the addition thereto of certain polyhydric alcohols such as glycerol, mannitol or sorbitol or water-soluble polymers such as polyvinylpyrrolidone or dextran.

3,599,151

CHARACTER RECOGNITION PHOTOSENSING APPARATUS HAVING A THRESHOLD COMPARATOR CIRCUIT

Jerome Danforth Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

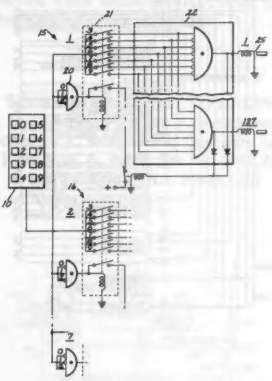
Filed Dec. 29, 1969, Ser. No. 888,628
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 A **8 Claims**



The recognition of human and machine readable characters of a family of type of which each character has one or more narrow line segments on a contrasting background and is enhanced by a positive and negative peaked level photosensing arrangement. The sensing apparatus comprises an optoelectronic circuitry for interpreting optomechanical gated scanning of short straight line segments in seriatim. It produces an electric representation in response to the presence and absence of a character line segment in the image. A photosensitive element is arranged to receive light

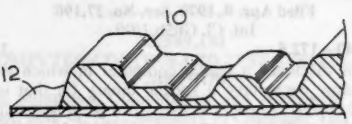
from an area on a document. The highest and lowest light values are translated in a reference level clamping circuit followed by positive and negative peak storage circuits. A threshold comparator circuit is individually coupled to the positive and negative peak storage circuits for delivering potential levels of two values indicating marks or spaces (the absence of marks). Preferably, threshold adjusting circuitry is interposed between one of the peak storage circuits and the threshold comparator circuit. Dynamic adjusting thresholding circuitry is included. Analog control circuitry is coupled to the storage and thresholding circuitry for timing and controlling the overall system by timing pulses conventionally obtained.

3,599,152
METHOD AND APPARATUS FOR DISTRIBUTING DRUGS AND THE LIKE
Robert L. Williams, 4354 Meadowwood, Rapid City, S. Dak.
Filed Nov. 15, 1968, Ser. No. 776,200
Int. Cl. H03k *13/00;* **H04q** *9/00*
U.S. Cl. 340—147 R **3 Claims**



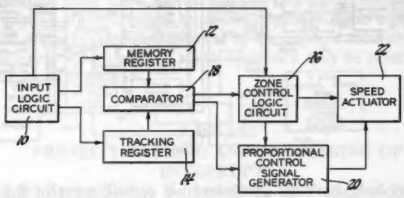
Command means located at a central pharmacy, including a touch-tone or rotary dial phone or some other signal transmitting device, operatively connected to a plurality of remotely positioned dispensing stations, such as cabinets located at patients' bedsides or at centrally located nursing stations, the remote dispensing stations each containing a plurality of drugs or the like and including dispensing means and signal accepting means, such as commercially available decoders, for accepting and identifying signals from the command means to dispense the correct drug at the correct station upon the receipt of a signal therefor.

3,599,153
MAGNETIC AUTHENTICATION OF SECURITY DOCUMENTS HAVING VARYING INK LEVEL CODING
Jerry Lewis, Mahwah, N.J., and Raymond J. Zablocki, Garden City, N.Y., assignors to United States Banknote Corporation, New York, N.Y.
Filed May 23, 1969, Ser. No. 827,403
Int. Cl. H04q *3/00*
U.S. Cl. 340—149 **9 Claims**



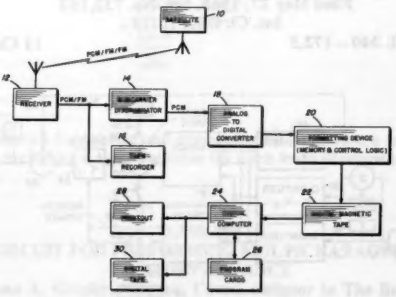
A document authentication technique is provided wherein at some predetermined region on the surface of said document there is printed a portion of an image in magnetic ink. The magnetic ink is deposited with predetermined variation of layer thicknesses, as is accomplished using the intaglio process. For readout, the magnetic ink is saturated by a constant magnetic field, and then passed under a magnetic reading head, which produces as its output, a signal having a unique multilevel waveform which is readily associated with the multilevels of magnetic ink which are deposited on the document. This unique waveform can be identified by comparison with a standard.

3,599,154
DIGITAL SPEED CONTROL SYSTEM
John A. Carol, Jr., Flint; Charles S. Cardani, Grand Blanc, and Arthur J. Schoendorff, Flint, all of, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 19, 1970, Ser. No. 21,076
Int. Cl. G05d *13/00*
U.S. Cl. 340—172.5 **7 Claims**



A controlled apparatus digital speed control system employing a memory register for counting a series of pulses having a frequency corresponding to the speed of the controlled apparatus for a specified duration of time and a tracking register for periodically counting the series of pulses for the same specified duration of time. A comparator compares the number of pulses counted in the memory register with the number of pulses counted in the tracking register and generates outputs which are utilized to maintain the speed of the controlled apparatus.

3,599,155
METHOD FOR EXTRACTING INFORMATION CONTAINED IN A SIGNAL DEGRADED BY NOISE
Robert B. McDowell, Beltsville, and Ronald V. Schreiber, Laurel, both of, Md., assignors to The United States of America as represented by the Secretary of the Navy
Filed Apr. 4, 1966, Ser. No. 540,093
Int. Cl. G06f *7/00;* **H04b** *15/00*
U.S. Cl. 340—172.5 **7 Claims**



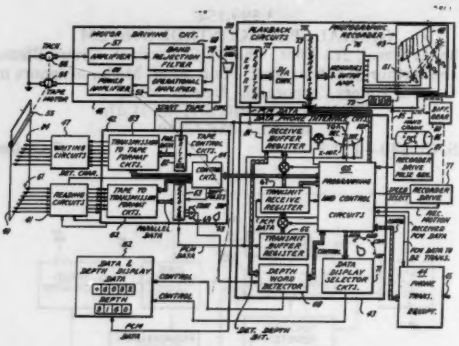
A method for recovering pulse code modulation (PMC) telemetry severely degraded by noise. In a preferred embodiment of the invention a noise degraded PCM signal is digitized after demodulation from its associated carrier to produce an output consisting of data words. A computer performs logical and numerical operations on the data words to enable the detection of the PCM waveform, ignoring the associated noise.

3,599,156

METHODS AND APPARATUS FOR TRANSMITTING DATA BETWEEN REMOTE LOCATIONS

Gerald K. Miller, and William D. Sauter, both of Fairfield County, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 6, 1968, Ser. No. 703,427
Int. Cl. G11b 5/00, 15/00
U.S. Cl. 340—172.5 31 Claims



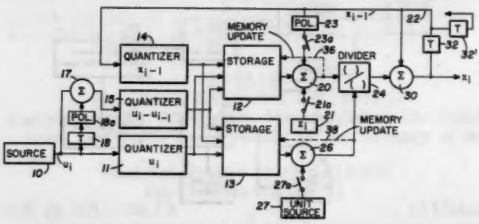
In accordance with an illustrative embodiment of the invention, a system for transmitting data between remote locations is disclosed. The data transmission system is especially desirable for the transmission of well logging data derived from an exploring means moved through a borehole. More specifically, data is read from a magnetic tape at a transmitting location and supplied to a transmission link for transmission to a receiving location. At the receiving end of the transmission link, the data is received and subsequently written on a magnetic tape. The transmitting and receiving ends of the transmission link are synchronized with each other by a periodically transmitted sync word which can be inhibited to allow for the transmission of borehole depth words. Additionally, apparatus is provided for displaying data and recording it on photographic film during transmission. Provision is also made for playing back a tape for recording on film or display.

3,599,157

FEEDBACK MINIMIZED OPTIMUM FILTERS AND PREDICTORS

William C. Choate, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 27, 1968, Ser. No. 732,152
Int. Cl. G06f 15/18
U.S. Cl. 340—172.5 11 Claims



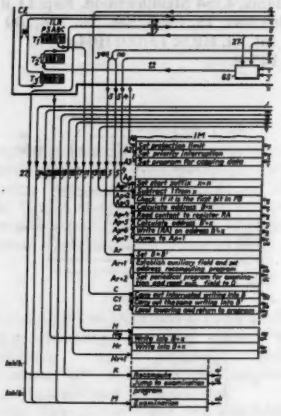
A nonlinear adaptive signal processor is provided wherein during a training phase, based upon a prior knowledge of the desired processor response to a given input, the output signal preceding the contemporary value of the output signal is employed in the feedback sense for minimizing storage required of the desired responses of the processor which, when trained, responds as desired to a different input having the same statistics as the input employed in the training phase.

3,599,158

METHOD FOR MOVING VARIABLE DATA DURING OPERATION FROM A FIRST STORE FIELD TO A SECOND STORE FIELD IN THE DATA STORE OF A COMPUTER

Lars-Olof Noren, Huddinge, and Goran Anders Henrik Hemdal, Tyreso, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 18, 1968, Ser. No. 784,847
Claims priority, application Sweden, Dec. 19, 1967, 17/372/1967
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 1 Claim



For a digital computer operating under a multilevel periodically occurring priority routine wherein information is transferable from a first field to a second field of a data store only during the lowest priority level, there is disclosed a method for updating information stored in the first field. The method contemplates preventing indiscriminate access to the first field. Instead, when during any level but the top priority level access is required to the first field for updating, the work being performed is interrupted and the computer switched to the top priority level. In this level, the updating information is simultaneously stored in corresponding locations of the first and second fields. Thereafter, the computer is restored to perform the interrupted work.

3,599,159

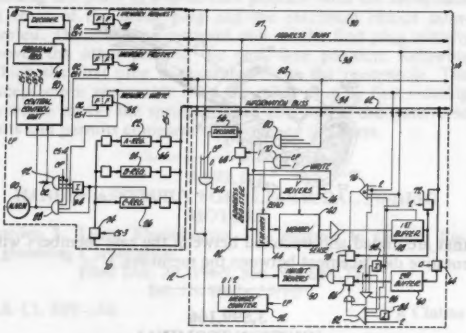
DIGITAL MEMORY WITH AUTOMATIC OVERWRITE PROTECTION

Bobby A. Creech, Glendora; Erwin A. Hauck, Arcadia; Carl B. Carlson, Santa Barbara; and Iver C. Hansen, Arcadia, all of Calif.

Continuation-in-part of application Ser. No. 670,101, Sept. 25, 1967
Filed Apr. 9, 1970, Ser. No. 27,190
Int. Cl. G05b 1/00
U.S. Cl. 340—172.5 3 Claims

There is disclosed a digital computer in which words in memory may each have a special binary bit that is set to one, for example, to prevent that word from being changed. Whenever a particular command attempts to write a new word in memory, the special bit is sensed in the memory buffer on reading out the existing word at the start of the memory cycle, and, if the bit has been set to one, the new word is rejected and the existing word is automatically restored in the same location in memory. The existing word

in memory is also transmitted to the processor. The processor is interrupted by the presence of the special bit in the

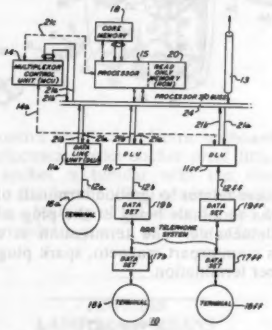


word transmitted from memory, indicating that a protected location in memory has been addressed.

3,599,160
TIME DIVISION MULTIPLEXING

Elliot Nestle, Neptune, and Robert F. Schunneman, New Monmouth, both of, N.J., assignors to Interdata Incorporated

Filed Mar. 6, 1969, Ser. No. 804,959
Int. Cl. G06f *9/18*; H04j *3/00*
U.S. Cl. 340—172.5 **15 Claims**



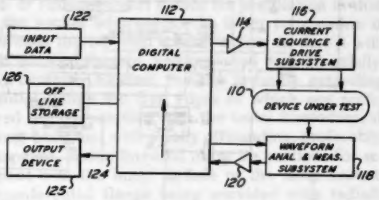
Digital time division multiplexing system and method for multiplexing and demultiplexing between serial data from a plurality of data lines and data in the form of parallel characters. Individual data line units are operable for loading and unloading data and a multiplexor control unit controls in sequence groups of the data line units. A processor controls input serial data flow from each data line unit through a buss and the processor into core memory. A fixed wired program has logic connections to the processor, core memory, multiplexor control unit and clock and has fixed program instruction blocks to control the operation of the multiplexor control unit, to determine the start of a character and to then control the strobing of the input serial data in the core memory.

3,599,161
COMPUTER CONTROLLED TEST SYSTEM AND METHOD

Alan M. Stoughton, Cinnaminson, and William R. Blatchley, Delran, both of, N.J., assignors to Computer Test Corporation

Filed Apr. 3, 1969, Ser. No. 813,165
Int. Cl. G06f *11/00*; G05b *23/00*
U.S. Cl. 340—172.5 **9 Claims**

A test system and method directed in operation by a programmed digital computer for measuring and evaluating a device which produces a nonrepetative waveform upon application to the device of an input stimulating signal. There is applied to an input of the device a stimulating signal having a predetermined waveform at a selected signal sequence. The

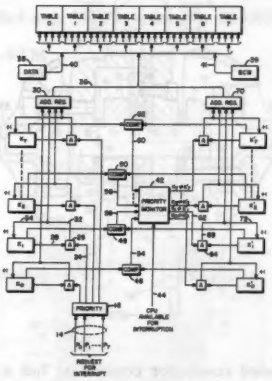


amplitude and time characteristics of the resultant nonrepetative waveform are explicitly measured and output reports are generated. In response to the explicit measurements a differing waveform and signal sequence may be selected for the stimulating signal.

3,599,162
PRIORITY TABLING AND PROCESSING OF INTERRUPTS

Paul D. Byrns; Duane H. Anderson, St. Paul, and Peter A. Meyer, Roseville, all of, Minn., assignors to Comcet Incorporated, St. Paul, Minn.

Filed Apr. 22, 1969, Ser. No. 818,324
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **3 Claims**



A circuit for tabling and processing interrupts on a priority basis including a separate table for each level of interrupt priority.

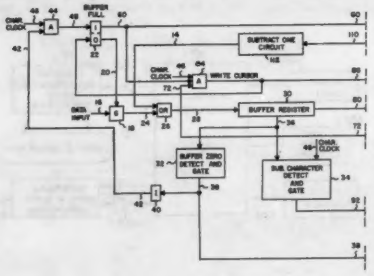
3,599,163
CIRCUIT FOR PERFORMING MULTICHARACTER POSITION ADVANCE

Stephen A. Grosky, Monroe, Conn., assignor to The Bunker-Ramo Corporation, Stamford, Conn.

Filed June 30, 1969, Ser. No. 837,824
Int. Cl. G06f *3/14*; G06t *13/02*
U.S. Cl. 340—172.5 **8 Claims**

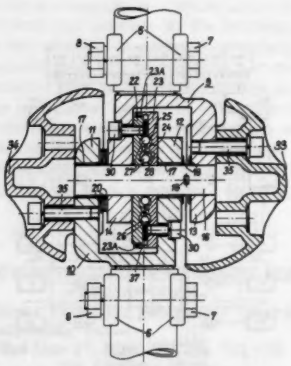
A circuit for performing a multicharacter position advance at a remote terminal in response to the receipt of only two input characters. The detection of the first of the input characters sets a control device which is operative to store the following character in a buffer and to cause the following character to be counted down by one each time a character position at the remote terminal passes a write position. When

the count in the buffer reaches a predetermined value, such as zero, the control device is reset, permitting the next



character applied to the terminal to be written into the character position then being accessed.

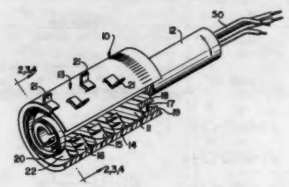
3,599,164
ARTICULATED CONDUCTOR CONNECTION
Winfried Oltersdorf, Augsburger Str. 22, 1 Berlin 30, Germany
Filed Apr. 17, 1969, Ser. No. 816,968
Claims priority, application Germany, Apr. 19, 1968, P 17 65 211.8
Int. Cl. H01r *39/28*
U.S. Cl. 339—4 **5 Claims**



An articulated conductor connection has a rotation axis and has two conductor plates disposed perpendicular to this axis. The conductor plates have mutually opposing surfaces each with a conical groove coaxial with the axis. The grooves define an annular channel of wedge-shaped cross section. Rollers are placed in the channel and function to transmit current between the plates; and springs are positioned intermediate the plates for radially pressing the rollers into the channel.

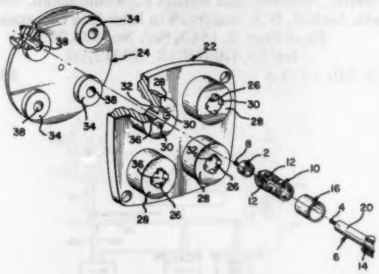
3,599,165
ROTARY CONDUCTOR
George Wendell; Le Roy J. Kniskern, and Walter F. O'Brien, Jr., all of Blacksburg, Va., assignors to Litton Precision Products, Inc., Blacksburg, Va.
Filed Mar. 2, 1970, Ser. No. 15,712
Int. Cl. H01r *39/00*
U.S. Cl. 339—5 **14 Claims**

An electrical coupling device providing a series of continuous, unbroken, unsliding electrical connections between two relatively rotatable members over a limited angular displacement. The coupler is provided with two coaxially related members that are rotatably interconnected for angular displacement, and between the members is provided in axially spaced array a series of isolated flexible electrical conductors



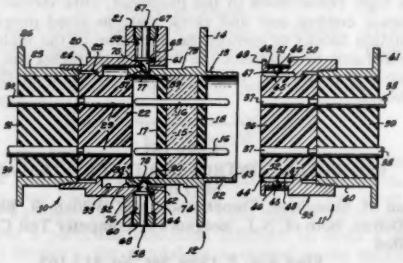
that are coiled and uncoiled between the said members with rotative displacement between the members.

3,599,166
IGNITION TERMINAL
Carmen Achille Cea, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 14, 1969, Ser. No. 876,820
Int. Cl. H01r *13/44*
U.S. Cl. 339—27 R **10 Claims**



The disclosure relates to ignition terminals of the type used in aircraft, the terminals being of the plug and socket type and being detachable. The termination is crimpable and locks into its counterpart magneto, spark plug or the like to provide proper termination.

3,599,167
THREE-UNIT ELECTRICAL CONNECTOR
David T. Adrian, and Norman C. Robman, both of Banning, Calif., assignors to The Deutsch Company Electronic Components Division, Banning, Calif.
Filed Apr. 10, 1969, Ser. No. 815,053
Int. Cl. H01r *13/44, 13/54, 13/60*
U.S. Cl. 339—42 **22 Claims**



The electrical connector includes two plugs which mate with an intermediate receptacle. A yieldable coupling connects the receptacle and one of the plugs, permitting separa-

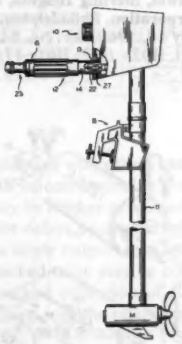
tion upon the exertion of a predetermined force. The other plug includes spring-pressed pins which enter transverse slots in the receptacle upon limited relative separating movement, holding the parts in a dead-face position with the receptacle in front of the other plug and the electrical circuit interrupted. Therefore, an outward pull on the first plug initially moves the other plug to the dead-face position, following which the first plug is separated from the receptacle. The receptacle is removable from the other plug by first rotating it, which moves the spring-pressed pins out of the transverse slots and permits complete separation of the parts.

3,599,168

HANDLE ASSEMBLY FOR ELECTRICAL FISHING MOTORS

Gordon L. Long, Bloomington, Ill., assignor to Osborn Engineering Corporation

Filed Dec. 29, 1969, Ser. No. 888,778
Int. Cl. H01r *15/10*
U.S. Cl. 339—58 **4 Claims**



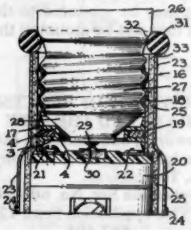
A tubular control handle for electric outboard fishing motors with an electrical outlet socket press fitted within the handle. The socket is tubular with the electrical parts recessed within the handle. The tubular handle is received within a bore in a housing of the assembly and held by a set-screw which provides a ground connection for the electrical elements.

3,599,169

LAMP LOCK MEANS

Lewis Detch, 2133 Chalfant St., Pittsburgh, Pa.

Filed Mar. 10, 1969, Ser. No. 805,589
Int. Cl. H01r *33/12*
U.S. Cl. 339—93 L **11 Claims**



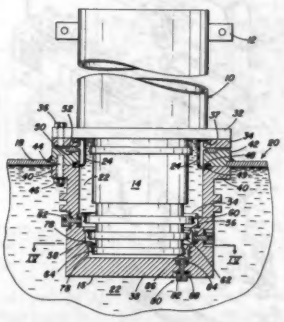
Locking means for incandescent lamps, particularly those having screw-threaded bases for assembly insertion in complementally screw-threaded lamp sockets, and serving to tightly seat the lamps in such sockets to the end that vibration, shock, heating and other possible service conditions will not cause the lamps to become loose, or "freeze," in the sockets, thus ensuring long life to the lamps, establishment of continuous good electrical contact between the lamp bases and sockets, guarding against escape of the lamps from the sockets with possible injury to persons in their vicinity, particularly when the lamps are installed in overhead locations, and generally serving to provide for improved lamp operation. The locking means comprise a substantially circular, yieldable or resilient insert device for installation in that portion of the socket adjacent to the inner termination of the screw threads thereof with a snap action so that it will normally be retained therein, and provided with an axially substantially centrally located, radially inwardly extending circumferential flange the free edges of which are preferably chamfered for cooperation with the usual frustoconical end of the lamp base, and with axially offstanding, preferably outwardly tapered, circumferential outer lip portions for seating engagement with the inner surface of the lamp socket; the said circumferential flange being provided with radially inwardly extending, outwardly opening groove means serving to enhance the normal yieldability or resiliency of the device, such groove means serving, by choice, to contain a normally compressible plastic substance, or a resilient member, which will function to maintain the original characteristics of the device for continuous and repeated use. The formation of the device is such that it may effectively function no matter which of its axial faces is disposed outwardly of the socket, thus guarding against improper installation by relatively unskilled operatives. The device is preferably formed from a moldable plastic substance, such as nylon, which is capable of withstanding the operating temperatures of incandescent lamps, and when the aforesaid groove is filled with a normally compressible substance such substance may be a silicone adhesive, for example that known as "RTV."

3,599,170

FLEXIBLE HERMETICALLY SEALED CONNECTOR

Albert G. Kurisu, Westminster, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 29, 1969, Ser. No. 863,005
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 M **3 Claims**



An electrical connection which has a flexible coupling boot that seals the connector members together, the connection having a system of flexible contacts that in association with the coupling boot permits three dimensional relative movement between the members while maintaining a hermetically sealed integrity.

3,599,171

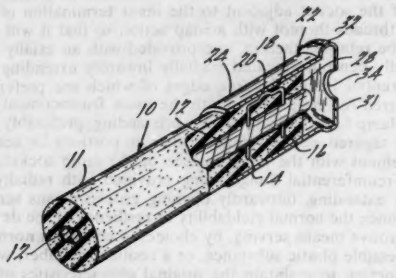
IGNITION CABLE CONNECTOR

Arnold E. Anderson, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 504,503, Oct. 24, 1965, now abandoned. This application Nov. 21, 1968, Ser. No. 777,562
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 C **4 Claims**

The disclosure relates to a dependable electrical termination for a high-voltage, low-current insulated electrical con-

ductor, i.e., an ignition cable and to the process of making the electrical termination. The termination comprises a metallic staple, preferably of U-shaped construction, which is driven through the insulating sheath of the ignition cable into firm electrical contact with a central current-carrying



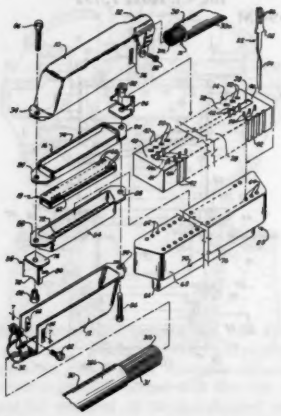
member of the nonmetallic type. The plane of the metallic staple is approximately parallel to the central current-carrying member, and the central portion of the staple is exposed. A conductive cylinder or ferrule is positioned over the end of the ignition cable and in electrical contact with the exposed central portion of the staple.

3,599,172

CABLE TERMINAL CONNECTOR, QUICK-CONNECT

Jeff Tuchto, Don Mills, Ontario, Canada, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed June 12, 1969, Ser. No. 832,796
Int. Cl. H01r *11/20*
U.S. Cl. 339—98 **8 Claims**



Cable connector in which the individual conductors can be put in position manually, without special tools, and in response to fitting one connector member together with a counterpart connector member, the conductors are automatically connected with corresponding contacts.

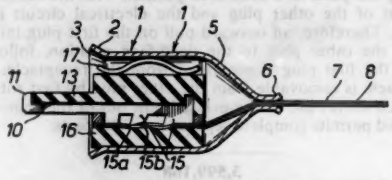
3,599,173

ELECTRICAL CONNECTORS

Kenneth F. Bridle, London, England, assignor to A. B. Electronics Components Limited, Glamorgan, Wales

Filed May 21, 1969, Ser. No. 826,639
Claims priority, application Great Britain, May 22, 1968, 24430/68
Int. Cl. H01r *11/20*
U.S. Cl. 339—99 **9 Claims**

An electrical connector for attachment to a tape cable comprises a four-layer sandwich consisting of a toothed contact to engage one side of the cable, a resilient pad to engage the other side of the cable and a spring to press the contact



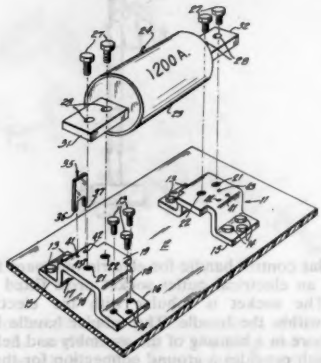
into the cable, the sandwich being compressed and inserted into a tubular housing which holds it compressed. The housing may then be crimped onto the cable behind the sandwich.

3,599,174

MEANS TO PREVENT OVER-FUSING

Shardha Singh Dhaliwal, Sterling Heights, Mich., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 18, 1969, Ser. No. 843,065
Int. Cl. H02b *1/02*; H01r *11/22*
U.S. Cl. 339—125 R **10 Claims**



Terminal straps to which cartridge fuses are bolt or screw connected are provided with locating means which establish predetermined operative positions for a reject member securable to one or more of the terminal straps. When the reject member is not present, fuses of relatively high intermediate and low ratings may be mounted to the terminal straps. When the reject member is mounted in one of its operative positions, only the low rated fuse may be mounted to the terminal straps, and when the reject member is in another one of its operative positions, both the low and intermediate rated fuses may be mounted to the terminal straps, but high rated fuses may not be mounted thereto.

3,599,175

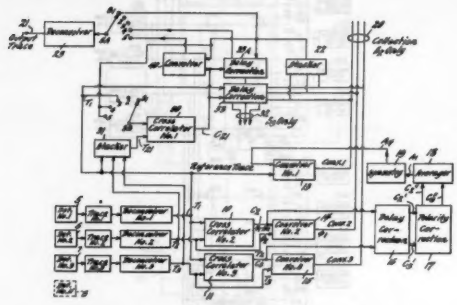
SYSTEM AND METHODS OF PROCESSING SEISMIC DATA AND THE LIKE

Timothy J. Hollingsworth, and James D. Morgan, both of San Antonio, Tex., assignors to Petty Geophysical Engineering Co., San Antonio, Tex.

Continuation of application Ser. No. 606,245, Dec. 30, 1966, now abandoned. This application Sept. 12, 1969, Ser. No. 857,605
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 AC **3 Claims**

This invention discloses data processing system embodiments and methods for analyzing a set of seismic signals, which embodiments and methods are useful for processing other sets of signals of this sort. Thus, signals recorded from a set of spaced seismic detectors and preliminarily processed for availability in recorded form are reproduced and cross-

correlated against a reference signal which typically is derived from the output of the detector closest to the seismic impact or shot source. The resulting signals are further processed to correct for any variations in timing and polarity and are averaged together as a single signal trace. In this form the signals, which have an amplitude peak at midpoint, are halved and one-half is symmetrically reproduced on either side of the midpoint to produce a modified signal, which may be convolved against the reference signal to form



one signal in a collection with others obtained from convolving each trace with its corresponding cross-correlated signal. This collection may be further processed by simply stacking, or by correcting for delays by comparison with the reference trace, to provide a single output trace after deconvolution. In some cases the stacked trace may be convolved with a trace derived from a stacked collection of the original recorded traces cross-correlated with the reference trace, which resulting trace is deconvolved to produce a single output trace.

3,599,176

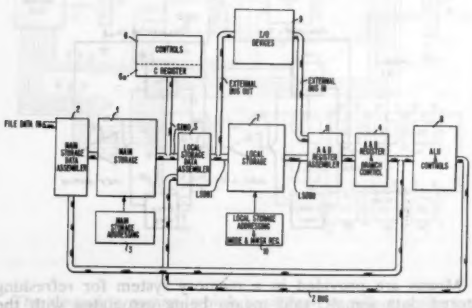
MICROPROGRAMMED UTILIZING IMPROVED STORAGE ADDRESSING MEANS

Humberto Cordero, Jr., Endicott; Edward G. Drimak, Johnson City; Richard J. Hutchinson, Vestal; Michael F. Schaughency, Endwell, and Everett M. Shimp, Endwell, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1968, Ser. No. 695,081

Int. Cl. G06f *9/16*

U.S. Cl. 340—172.5 **15 Claims**



A data processing system characterized by a high speed local storage unit used for storage of addresses and data involved in a variety of operations. Accesses to a main storage unit, containing both macroprogram and microprogram information, is under the control of addresses held in local storage. Transfer from a main line program to an interrupt subroutine is also handled by the local storage unit.

3,599,177

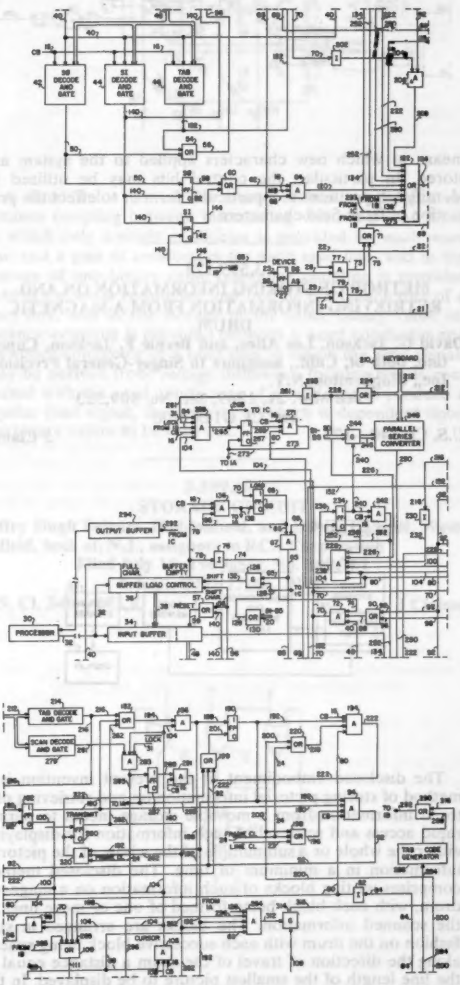
CHARACTER STORAGE AND DISPLAY SYSTEM

Dixson Teh-Chao Jen, Stamford; Stephen A. Grosky, Monroe, and Robert J. Duggan, Monroe, all of, Conn., assignors to The Bunker-Ramo Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 727,934, May 9, 1968, now abandoned. This application Sept. 16, 1968, Ser. No. 767,559

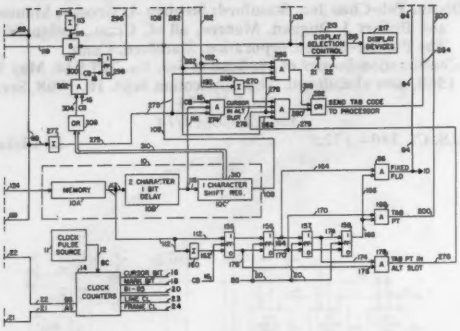
Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **23 Claims**



A system for storing characters of information in a selected form in a storage means which has a plurality of character positions. Characters are recorded in each position in a multibit code and means are provided for storing an additional control bit in each of the character positions. A selected form may be stored in the storage means by storing bits in

selected ones of the control bit positions in accordance with a predetermined logical pattern. The state of each control bit is detected and utilized for controlling the field in the storage



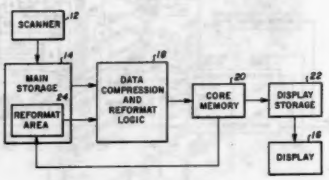
means in which new characters applied to the system are stored. In particular, the control bits may be utilized to identify tab positions in a particular form or to effect the protection of fixed field characters.

3,599,178

METHOD OF STORING INFORMATION ON AND RETRIEVING INFORMATION FROM A MAGNETIC DRUM

David G. Jackson, Los Altos, and Bernie F. Jackson, Cupertino, both of, Calif., assignors to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Mar. 21, 1969, Ser. No. 809,323
Int. Cl. G11b *5/00*
U.S. Cl. 340—172.5 **5 Claims**



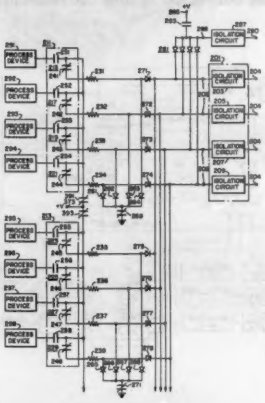
The disclosed embodiment of the present invention is a method of storing pictorial information on and retrieving pictorial information from a movable storage media to permit rapid access and retrieval of such information for displaying either the whole or a submultiple of the whole of the pictorial information in a minimum of time. The disclosed method comprises writing blocks of such information on a magnetic drum, with each block being formed of one or more lines of the scanned information. The blocks are arranged in step fashion on the drum with each successive block being spaced along the direction of travel of the drum a distance equal to the line length of the smallest picture to be displayed. In the disclosed embodiment, each block is formed of four scan lines written in 16-bit parallel format on the drum, and the spacing of each block is equal to the distance occupied by one-fourth of a scan line of information. Since the scanned information is greater than the displayed information, that portion of the information which is to be displayed is read from the drum, compressed by means of logic circuits, and supplied to a display storage. The information in the display storage is continuously read and supplied to a CRT for display to an operator.

3,599,179

FAULT DETECTION AND ISOLATION IN COMPUTER INPUT-OUTPUT DEVICES

Wayne E. Arnold, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1969, Ser. No. 828,625
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **20 Claims**



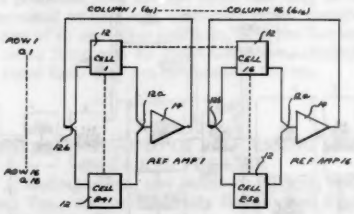
Computer-control systems, in addition to the computer itself, require various peripheral equipment to transmit computer commands to the process and to receive general and emergency information from the process. Failure of this equipment can cause serious malfunctions in the process. A system is disclosed for locating and isolating faults in these input-output devices before the controlled process gets out of control. This is accomplished by monitoring the back contacts of the relays or switch devices to see if the relays or switch devices have operated properly.

3,599,180

RANDOM ACCESS READ-WRITE MEMORY SYSTEM HAVING DATA REFRESHING CAPABILITIES AND MEMORY CELL THEREFOR

Richard B. Rubinstein, New York; John O. Paivinen, Huntington; Leo Cohen, Commack, N.Y.; John Leland Seely, Salt Lake City, Utah, and Attila Tetik, New York, N.Y., assignors to General Instrument Corporation, Newark, N.J.

Filed Nov. 29, 1968, Ser. No. 780,005
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **55 Claims**

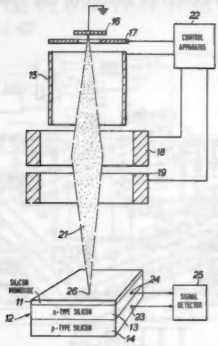


Means are provided in a memory system for refreshing stored data signals, said means being associated with the memory cell address circuitry provided for selecting the desired word location or address. Also disclosed is a novel three device memory cell defining each data storing location of the system, and a novel refresh amplifier used in the data refreshing mode of system operation. In one disclosed embodiment refreshing of the stored data is automatically effected during read and write operation by a novel address logic system.

3,599,181
SOLID STATE COMPUTER MEMORY DEVICE

Geoffrey Dearnaley, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 6, 1968, Ser. No. 781,721
Claims priority, application Great Britain, Dec. 7, 1967, 55787/67
Int. Cl. G11c *11/34*
U.S. Cl. 340—173 CR 8 Claims

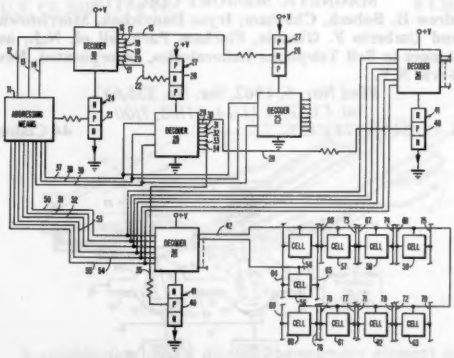


A film of oxide or fluoride on a conducting or semiconducting substrate is scanned by a finely focused electron beam. According to the intensity of the electron beam, filamentary conducting paths through the film may be set up, detected without destruction, or erased. Depending upon the size of the electron beam spot up to 10^7 bits of binary information per square centimeter may be stored in the device.

3,599,182
MEANS FOR REDUCING POWER CONSUMPTION IN A MEMORY DEVICE

Robert A. Henle, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,306
Int. Cl. G11c *7/00, 5/02*
U.S. Cl. 340—173 R 14 Claims

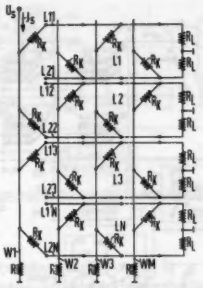


The decoding means, which is utilized to select a storage cell or word in a memory device, is divided into a main decoder and at least a first group of decoders whereby only one of the first group of the decoders is activated when the main decoder is energized. Each of the decoders of the first group may be divided into a plurality of decoders that form a second group so that only one of the decoders of the second group also needs to be activated when the decoder of the control first group is energized.

3,599,183
FIXED VALUE STORER

Ingo Groeger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 28, 1969, Ser. No. 870,038
Claims priority, application Germany, Dec. 5, 1968, P 18 12 963.0
Int. Cl. G11c *13/00, 17/00*
U.S. Cl. 340—173 R 4 Claims

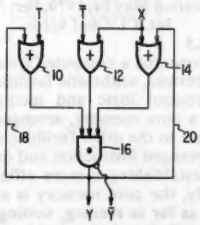


A fixed value storer, for binary values, employing resistance coupling between intersecting word and read lines, in which only a single conductor is provided for each word line and a pair of conductors for each read line, and in the storage of one binary value resistance coupling is provided between a word conductor and one of the conductors of a read line, and in the storage of the other binary value resistance coupling is provided between a word conductor and the other conductor of a read line, in which the read signals may be derived from voltage difference forming means connected with the read conductors of a read line to produce a bipolar read signal, the polarity of which is dependent upon the binary values to be read out.

3,599,184
STORAGE CIRCUIT

Jeffry Hugh Beinart, Haddonfield, and Daniel Hampel, Westfield, both of, N.J., assignors to RCA Corporation

Filed July 10, 1969, Ser. No. 840,761
Int. Cl. G11c *11/40, 19/00*
U.S. Cl. 340—173 R 3 Claims

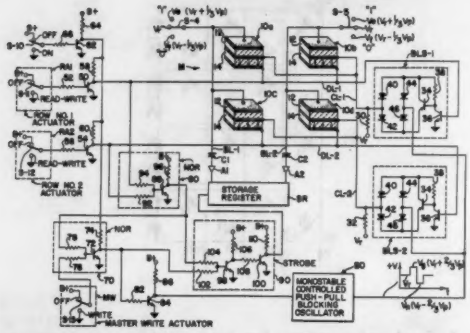


A plurality of two-input logic gates such as OR gates supplying their outputs to a three-input logic gate such as an AND gate and including a feedback connection from the three-input gate to all but one of the two-input gates. A control signal is applied to the two-input gate not receiving feedback and the complement of this control signal is applied to one of the other two-input gates. An information signal is applied to the two-input gate not receiving feedback and to a two-input gate not receiving the complement of the control signal.

3,599,185
FERROELECTRIC CAPACITOR OUTPUT AMPLIFIER DETECTOR

Peter G. Bartlett, Davenport, Iowa, and Joseph E. Meschi, Lyons, Ill., assignors to Gulf & Western Industries, New York, N.Y.

Filed July 10, 1968, Ser. No. 748,582
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 5 Claims



An improvement is provided for two-plate internally polarized nondestructive readout ferroelectric ceramic capacitor, binary memory elements in which one plate serves as the drive plate and the other serves as the memory plate. There is an electrical bit line connection to the memory plate from which a positive or negative voltage is obtained, depending upon the binary information which has been stored in the memory plate. A normally conductive amplifier is provided for normally providing a first signal of the first value and serving to increase the value of the first signal when the bit line output voltage is positive and to decrease the value of the first signal when the bit line voltage is negative. A signal level detector is also provided having first and second outputs responsive to the first signal for energizing the first and second outputs in accordance with whether the value of the first signal is above or below a predetermined value.

3,599,186
MEMORY-CENTERED COMPUTER SYSTEM

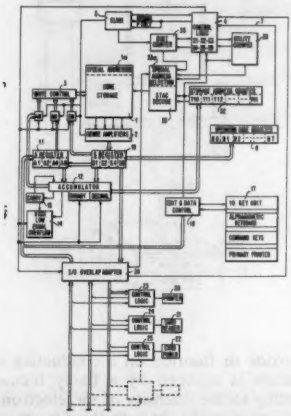
Frederick T. May, and Thomas H. Williams, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 668,599, Sept. 18, 1967. This application May 14, 1970, Ser. No. 37,324
Int. Cl. G06f *9/16*
U.S. Cl. 340—172.5 5 Claims

The invention concerns a computer system with the usual input and output devices, arithmetic facilities, clocking facilities, associated control logic and incorporating memory facilities, such as a core memory, arranged in a centralized manner with respect to the other facilities of the system, and having uniquely arranged instruction and data accessing control circuitry for establishing a more efficient utilization of hardware. Basically, the core memory is arranged in a conventional manner as far as reading, writing, and transferring of data is concerned, but beyond this, has particular addressable areas designated Special Addresses for facilitating the processing of both instructions and data with a minimum amount of external hardware. The system operates with only a single address register for accessing both instruction and operand information. In a usual case, an operand is accessed and placed in the special address section of memory by using the addressing facilities. Thereafter, another operand is accessed and the operation required is performed with one operand in the special address section accessed by implied addressing, rather than accessing by the conventional addressing facilities. The foregoing arrangement requires a somewhat longer processing interval, but permits the satisfactory accomplishment of all processing required by the use of a unitary essentially single addressing facility.

The system is considered to be memory-centered since the memory is involved in practically all of the operations performed in the system. Thus, for example, the memory is used in storage of data and instructions, contains index registers and input/output data address, input/output length counts, editing formats, command key conditions, and various special words required during processing of information.

The system operates according to predetermined clocking intervals during which the accessing of instructions, data, input/output transfers, etc. are performed, and in connection with the memory-centered aspect of the system, the clocking



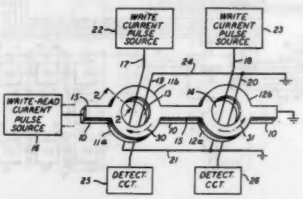
circuits are arranged for permutation in order that only a single operand or a pair of operands may be accessed, as circumstances may require.

The system incorporates various counting means associated with the aforementioned primary addressing facilities to control the reading and writing of information both directly, sequentially, and sequentially within a selected block of information. The latter is particularly advantageous in operations requiring a repetitive accessing of selected areas of memory, such as during certain arithmetic operations, recomplementing, Multiply operations, and so on.

3,599,187
MAGNETIC MEMORY CIRCUITS

Andrew H. Bobeck, Chatham; Iryne Danylchok, Morristown, and Umberto F. Gianola, Florham Park, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, New York, N.Y.

Filed Nov. 6, 1962, Ser. No. 235,612
Int. Cl. G11c *11/14, 11/08, 7/00*
U.S. Cl. 340—174 CH 44 Claims



An elongated electrical conductor having parallel branch conducting paths wherein portions of the conductor comprising the branch conducting paths are made of magnetic material having rectangular hysteresis characteristics. A closed magnetic flux is induced around the branch conducting paths by applying a write current pulse to one end of the conductor coincidentally with a write current pulse applied to a write conductor which threads the aperture formed by the branch conducting paths.

3,599,188

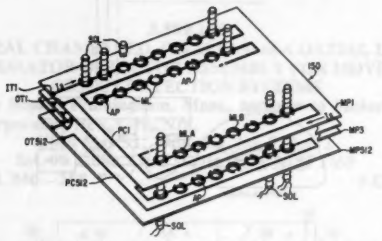
SOLENOID ARRAY MEMORY HAVING BIPOLAR OUTPUT SIGNALS

James M. Donnelly, Carol Stream, Ill.; Kenneth E. Larabee, Waseca, Minn., and Bernard J. Reklere, Addison, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Continuation of application Ser. No. 379,941, July 2, 1964, now abandoned. This application Aug. 18, 1969, Ser. No. 860,141

Int. Cl. G11c *11/04, 17/00*

U.S. Cl. 340—174 SP 5 Claims



Card changeable read only solenoid array memory systems employ printed data planes as the storage medium. In one system the data planes are connected to and directly energized by word drivers, while a second system employs solenoid driven connectionless planes. The printed conductors of the data planes partially encircle the sensing solenoids in a clockwise or counterclockwise direction to store binary coded data and provide bipolar output signals.

3,599,189

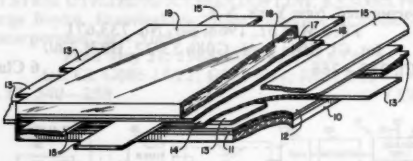
DISPLAY MEMORY

David R. Hadden, Jr., Eatontown, and Lorenz M. Sarlo, Matawan, both of, N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 14, 1969, Ser. No. 866,182

Int. Cl. G11c *11/42, 11/14, 5/02*

U.S. Cl. 340—174 YC 6 Claims



A combination digital display and memory element comprising a thin film of magnetic material having a uniaxial anisotropy, a matrix of crossed conductors, and a thin film of rotatable anistropic magnetic material having a dense banded domain structure. A coloidal suspension of ferromagnetic particles covered with a transparent chamber is placed over the magnetic material. Light directed at the coloidal suspension will be reflected to produce an image of the domain structure contained in the magnetic films. The domains are selectively produced by generating currents on the crossed conductors.

3,599,190

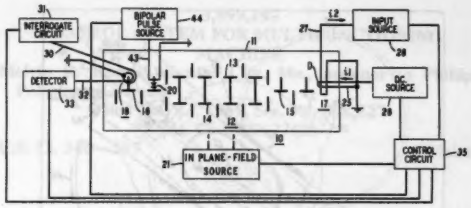
MAGNETIC DOMAIN LOGIC ARRANGEMENT

James L. Smith, Bedminster, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 20, 1969, Ser. No. 878,411

Int. Cl. G11c *19/00, 11/14*

U.S. Cl. 340—174 TF 8 Claims



Single wall domains are moved in a sheet of magnetic material along paths defined by pole patterns in magnetically soft overlays in response to reorienting magnetic fields in the plane of the sheet. The direction in which domains move is determined by the magnetic state of high coercive force material adjacent selected portions of the overlay for selectively modifying pole patterns.

3,599,191

DATA STORAGE APPARATUS

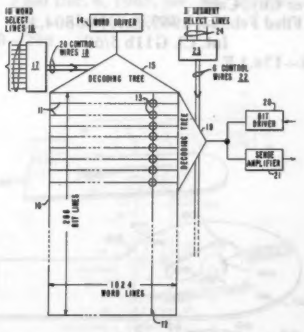
John B. Gillett, Whitenap, Romsey, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1969, Ser. No. 820,424

Claims priority, application Great Britain, May 2, 1968, 20766/68

Int. Cl. G11c *11/14, 5/02, 7/00*

U.S. Cl. 340—174 TF 8 Claims



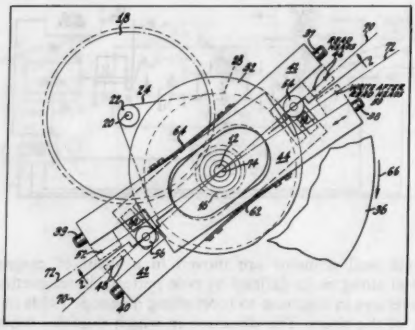
A magnetic film memory is non-destructively interrogated by applying an oscillatory signal of frequency f to a selected word line. Output data signals of frequency 2f are generated on the bit lines as a result, the phase of which is characteristic of the information stored. Superimposed on each data signal is a capacitive noise signal of frequency f. The composite signal on each bit line is passed to a filter network which separates the capacitive noise component from the data component. The data signal is sampled once per cycle under control of strobe signals generated from the capacitive noise signal. The strobe signals are timed to coincide with a region of maximum fluctuation of the data signal, the sampled signals indicating the phase of the data signal and hence the binary value stored.

3,599,192

TRANSDUCER SUPPORTING ARRANGEMENT FOR DISK MEMORY

Jan W. Rabek, Los Angeles, Calif., assignor to RCA Corporation

Filed Dec. 11, 1968, Ser. No. 782,926
Int. Cl. G11b *5/48, 21/04*
U.S. Cl. 340—174.1 B **5 Claims**



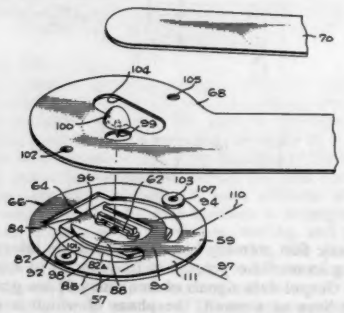
A disk storage system in which the spacing between a pair of heads employed to respectively write on and read from the disk is a function of the spacing of the heads from the center of the disk. The heads are moved along radial lines relative to the center of the disk while maintaining them substantially equidistant from the center of the disk to maintain constant the number of bits recorded in the length of track between the heads.

3,599,193

TRIFURCATED GIMBAL HEAD MOUNT

Lawrence Cote, Englewood, Colo., and Carl C. Roecks, Palos Verdes Estates, Calif., assignors to Data Products Corporation, Culver City, Calif.

Filed Feb. 24, 1969, Ser. No. 804,359
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 E **8 Claims**



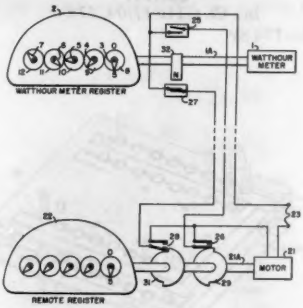
Apparatus for use in a disc storage system to support the read/write heads on the flying disc surface, comprising a gimbal formed as a flat sheet of spring material with an outer ring portion, a central portion within the outer ring portion for supporting the head, and a narrow neck connecting them. Each gimbal is held on a long flexible support leaf, and the heads are landed and withdrawn by landing springs which can depress or release the support leaves.

3,599,194

REMOTE REGISTER APPARATUS FOR INTEGRATING DEVICES

George W. Lipscomb, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1969, Ser. No. 802,534
Int. Cl. G08c *19/16, 19/20*
U.S. Cl. 340—203 **7 Claims**



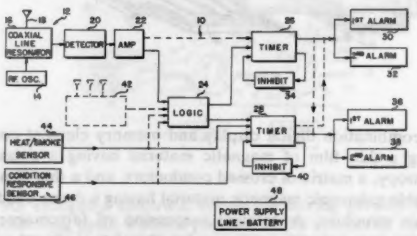
An arrangement is provided for indicating at a remote point the readings of an integrating device such as an electrical watthour meter. The meter may have a register which comprises a train of gears for driving pointers over a series of dials. The pointers coact with the dials to register respectively the digits zero through nine in the various orders such as units, tens, hundreds etc. of the meter reading at any time. A duplicate series of pointers and dials are operated by a motor at a remote point. Two pairs of switches in multiple with each other connect the motor to its power supply. Each pair of switches comprises a switch located at the meter which is operated to closed condition briefly for each occurrence of a predetermined increment in the reading of the meter. Each pair of switches also includes at the remote point a switch which is held closed during a predetermined advance of the remote register and which is held open during the next corresponding advance of the remote register. The arrangement may be such that the switching system causes the units pointer at the remote register to advance a half revolution as soon as the units pointer of the meter registers values of zero and five. In this arrangement, the units pointer at the remote register always reads within five units of the meter register.

3,599,195

DUAL ALARM, COAXIAL LINE RESONATOR, INTRUSION DETECTION SYSTEM

George Boyko, Framingham, Mass., assignor to Pinkerton's Incorporated, New York, N.Y.

Filed May 31, 1968, Ser. No. 733,671
Int. Cl. G01s *9/44;* **G08b** *13/22;* **H03f** *3/60*
U.S. Cl. 340—258 **6 Claims**



An alarm system having at least one condition responsive sensor. A plurality of sensors can be employed in the system to detect such conditions as the presence of a moving intruder within a protected area, heat and/or smoke, the movement of windows and doors, the presence or absence of in-

frared and/or visible radiation, and any other condition that can be monitored by sensing means. The system preferably includes a logic circuit that is programmed to respond to the output signals from one or more preselected sensors. At least one timer is used to actuate a first alarm device in response to a first alarm signal from one or more of the condition responsive sensors. If a second alarm signal occurs within a predetermined period of time after the first alarm signal, a second alarm device is actuated. The timer is reset if the second alarm signal does not occur within the predetermined time period. False alarm signals are minimized by inhibiting the second alarm portion of the timer for a short interval after the first alarm signal and at the end of each full timing cycle. The alarm system employs full solid-state circuitry and has a standby DC power capability.

3,599,196

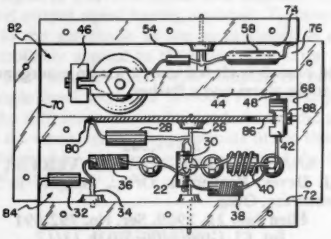
PLURAL CHAMBERED, OSCILLATOR-COAXIAL LINE RESONATOR-DETECTOR ASSEMBLY FOR MOVING OBJECT DETECTION SYSTEMS

George Boyko, Framingham, Mass., assignor to Pinkerton's, Incorporated, New York, N.Y.

Filed May 31, 1968, Ser. No. 733,672

Int. Cl. G08b *13/22;* **G01s** *9/44;* **H03f** *3/60*

U.S. Cl. 340—258 **5 Claims**



A plural chambered assembly for electromagnetic moving object detection systems. One chamber forms the outer conducting surfaces of a cavity resonator having a centrally disposed conductor short-circuited at one end to the conducting surfaces and open at the other end. Collectively the center conductor and outer conducting surfaces define a coaxial line resonator. A rectifier and rectifier load are electrically connected to the center conductor and physically mounted within the cavity chamber. A second contiguous chamber houses a solid-state, sinusoidal, continuous wave oscillator. A radiator is capacitively coupled to the center conductor of the coaxial line resonator.

3,599,197

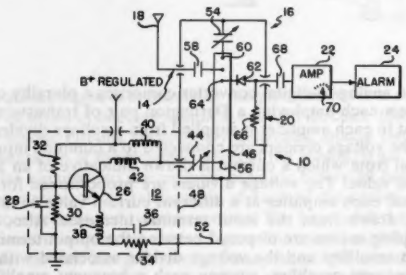
ELECTROMAGNETIC MOVING OBJECT DETECTION SYSTEM UTILIZING A COAXIAL LINE RESONATOR

George Boyko, Framingham, Mass., assignor to Pinkerton's, Incorporated, New York, N.Y.

Filed May 31, 1968, Ser. No. 733,673

Int. Cl. G08b *13/22;* **G01s** *9/44;* **H03f** *3/60*

U.S. Cl. 340—258 **7 Claims**



A continuous wave, electromagnetic moving object detection system which responds to impedance changes in the antenna circuit produced by motion of an object through the area protected by the system. Increased sensitivity for a given level of radiated power and isolation of the oscillator circuitry from the detuning effects of changes in the protection environment are achieved by utilizing a coaxial line resonator. Alarm means actuated by detection of the impedance changes are employed to give an electrical, visual and/or audible indication of the presence of a moving object within the protected area.

3,599,198

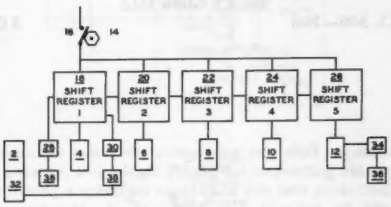
CONTROL SYSTEM FOR MULTIFUNCTIONING MACHINE

Melvin R. Harrell, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Oct. 23, 1969, Ser. No. 868,827

Int. Cl. G08b *21/00*

U.S. Cl. 340—267 **5 Claims**



An improved control system comprising a plurality of shift registers associated with sensing means and machine components of a multifunctioning machine for interrupting the operation of a machine component in response to a signal indicating a prior malfunctioning machine component.

3,599,199

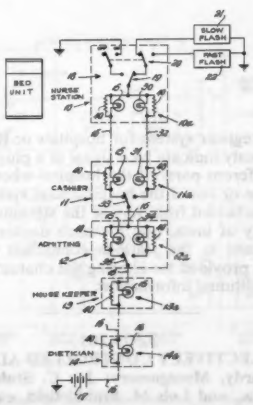
SYSTEM FOR SIMULTANEOUSLY INDICATING A UNIT STATUS AT A PLURALITY OF STATIONS

Earl L. Bunting, Westport, Conn., assignor to Bunting Sterisystems, Inc., Bridgeport, Conn.

Filed Dec. 6, 1968, Ser. No. 781,864

Int. Cl. G08b *25/00*

U.S. Cl. 340—286 **7 Claims**



A system for indicating to a plurality of administrative stations, by signal means, the status of the individual unit. Preferably, the administrative station adjacent the unit has means controlling the signals to energize the signaling means in all stations simultaneously to indicate the status of the unit. For example, in a hospital the system would indicate the status of a patient-bed unit. It would be controlled at the nur-

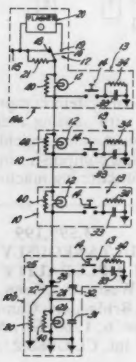
ses' station to supply the proper signals to energize the signal means and alert the cashier, admitting office, housekeeper, dietician and other desired administrative stations that the bed is occupied, the patient is to be discharged, the patient has left the bed and it should be made up, and that the bed is ready for occupancy so that each administrative station can be ready to perform its required function.

Heretofore in a hospital, for example, the records for each patient-bed unit were filed in filing cabinets at each administrative station and the status of each unit was not readily discernible. When there was any change in the unit status, it was necessary for the nurse or someone to advise each station individually. The record was then removed from the file and acted upon accordingly.

3,599,200
DOCTORS REGISTER

Earl L. Bunting, Westport, Conn., assignor to Bunting Sterisystems, Inc., Bridgeport, Conn.

Filed Dec. 4, 1969, Ser. No. 882,121
Int. Cl. G08b *5/22*
U.S. Cl. 340—286 **3 Claims**



A doctors register system for hospitals or the like adapted to simultaneously indicate by a signal at a plurality of stations located in different parts of the hospital whether the doctor has checked in or out of the hospital, said system being capable of being actuated from any of the stations each of which has a plurality of units, one for each doctor, with the corresponding units in the stations connected together. Also, means can be provided for altering the character of the signal to provide additional information.

3,599,201
SELECTIVELY CONTROLLED ALARM

Lewis L. Clardy, Montgomery; Joe C. Stubblefield, Montgomery, Ala., and Lois M. Stubblefield, executrix, of said Joe C. Stubblefield, deceased, assignors to Leon L. Clardy, a.k.a. Lewis L. Clardy

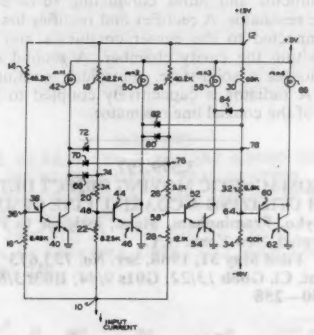
Filed Apr. 23, 1968, Ser. No. 723,440
Int. Cl. G08b *23/00*
U.S. Cl. 340—326 **6 Claims**

Switch means selectively energizes one of two parallel circuit branches. The first branch includes a lighting lamp and photocell switch connected in series and housed within a lamp post for providing general illumination when ambient light conditions are lowered to a predetermined range. Upon actuation of the switch means, the first branch is opened and the second branch is closed to operate an emergency colored lamp, an audio alarm and a flasher.

3,599,202
ANALOG-TO-DIGITAL CONVERTER

William J. Devey, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 21, 1969, Ser. No. 792,691
Int. Cl. G08c *9/00;* **H03k** *13/17*
U.S. Cl. 340—347 AD **6 Claims**



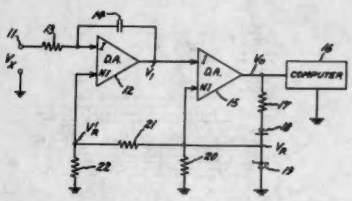
An analog-to-digital converter comprises a plurality of amplifiers each employing a Darlington pair of transistors. The input to each amplifier is supplied from a voltage divider, and all the voltage dividers are connected to a common input terminal from which a current is drawn indicative of an analog input value. The voltage dividers are proportioned for turning off each amplifier at a different current value as the current drawn from the input terminal increases. Also, diode coupling means are disposed between the output terminal of each amplifier and the voltage divider associated with each subsequent amplifier, causing each subsequent amplifier to remain in a nonconducting state until the previous amplifier is turned off. As the input current increases, only one transistor amplifier conducts at a time.

3,599,203

ASYNCHRONOUS ANALOG TO LOGIC LEVEL SIGNAL CONVERTER

James W. Conley, Scotia, N.Y., assignor to General Electric Company

Filed July 30, 1969, Ser. No. 846,007
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 10 Claims



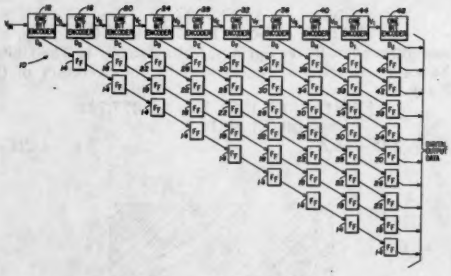
An asynchronous analog to logic level signal converter is described as comprising a first differential amplifier with means for integrating an input analog signal and applying the integrand signal to a second differential amplifier to produce a logic level output signal having a period, T_1, inversely proportional to the amplitude of the input signal. A reference signal controllably applied to the other differential inputs of the first and second differential amplifiers produces a changed logic level having a period, T_2, inversely proportional to the difference in amplitudes between the reference signal and the input signal. The amplitude of the input analog signal is obtained by computing the product of the reference voltage and the ratio of T_2 to T_1 plus T_2.

3,599,204

TECHNIQUE FOR HIGH SPEED ANALOG-TO-DIGITAL CONVERSION

John A. Severin, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1967, Ser. No. 694,531
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 1 Claim



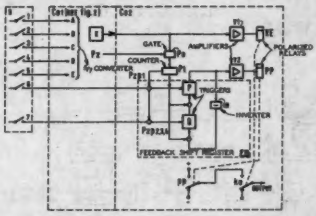
An analog signal is sequentially sampled and fed into a plurality of series connected identical encoder circuits. Each of the encoder circuits successively generates analog outputs representative of the sampled values of the analog signal. The encoder circuits also successively generate binary bit outputs representative of the relationship of each of the analog outputs to a preselected reference value. The binary bit outputs are stored in sequential order of generation until each of the encoder circuits has generated a binary bit output associated with a particular sampled value of the analog signal, whereupon all the stored binary bit outputs are simultaneously read out as a parallel digital word representative of the particular sampled value of the analog signal.

3,599,205

BINARY TO TERNARY PROTECTED CODE CONVERTER

Hendrik Cornelis Anthony Van Duuren, Wassenaar, and Herman Da Silva, Voorburg, both of, Netherlands, assignors to De Staat Der Nederlanden, Ten Deze Vertegenwoordigd Door De Directeur-Generaal Der Posterijen, Telegrafie En Tetefonie

Filed Aug. 28, 1968, Ser. No. 756,020
Claims priority, application Netherlands, Sept. 4, 1967, 6712110
Int. Cl. H04l 3/00; G06f 5/00; H03k 13/24
U.S. Cl. 340—347 DD 10 Claims



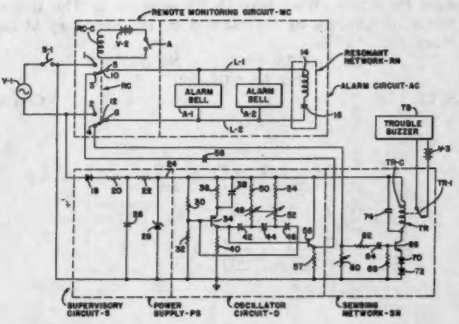
A first code converter comprising two shift registers, one with a counter, and a logic circuit for converting binary code signals having a specified number of bits into protected code signals preferably having the same number of bits and preferably exhibiting a specified 0-bit/1-bit ratio, and a second code converter comprising a counter, a feedback shift register, and two keying devices for converting the 1-bits for transmission at two levels, such as potentials, amplitudes, or frequencies, different from the level at which the 0-bits are transmitted, to form a ternary code with the number of 1-bits transmitted at one level and the number of 1-bits transmitted at the other level exhibiting a constant ratio.

3,599,206

ALARM CIRCUIT SUPERVISORY MEANS

Robert B. McLeod, Clinton, Mass., assignor to N Gulf & Western Systems Company, New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,107
Int. Cl. G08b 29/00
U.S. Cl. 340—409 20 Claims



There is disclosed in an alarm system, a supervisory signal monitoring circuit for providing an indication of a disruption in the system and comprising supervisory conductor means for normally carrying a supervisory current, termination circuit means coupled to the supervisory conductor means, and a trouble indicating circuit coupled to the supervisory conductor means. The trouble indicating circuit includes an oscillator circuit having first circuit means for developing an oscillating signal and second circuit means for applying the oscillating signal to the supervisory conductor means to

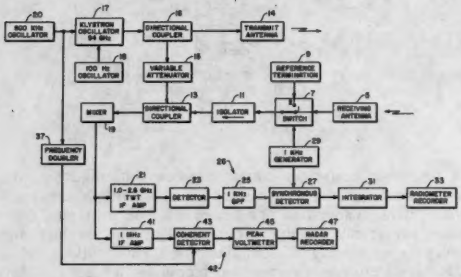
thereby cause a supervisory current to flow through the conductor means, resistive means coupled to the supervisory conductor means for developing a control signal in response to the flow of the supervisory current, trouble indicating means, and signal responsive circuit means coupled to the control signal developing means in response to the absence of the control signal to thereby provide an indication of a disruption in the supervisory conductor means.

3,599,207

COMBINED FREQUENCY MODULATED RADAR AND RADIOMETER

Donald L. Foian, Neptune, and Robert H. Pearce, Lincroft, both of, N.J.

Filed Oct. 16, 1969, Ser. No. 866,835
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 R **8 Claims**



This combined radar-radiometer includes a dual-frequency modulated oscillator which functions as the radar transmitter and as the radar and radiometer local oscillator. In one embodiment, one antenna serves to receive both radar and radiometric signals and another antenna transmits the radar signals. In the other embodiment one antenna serves all three functions. The radar and radiometer signals are processed and kept separate in paralleled channels.

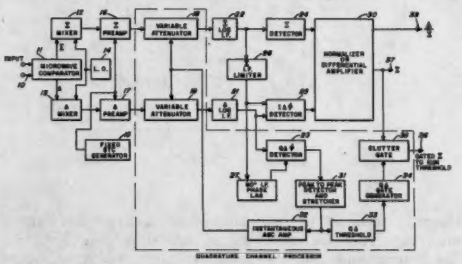
The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

3,599,208

RADAR SYSTEM

Robert P. Nelson, West Islip, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 25, 1969, Ser. No. 819,309
Int. Cl. G01s *9/22*
U.S. Cl. 343—7 A **5 Claims**



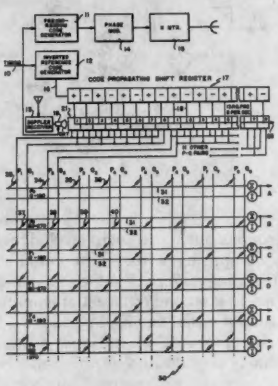
The invention relates to a radar system for enhancing the reception of desired echoes by the elimination of background clutter. The system comprises a monopulse radar system provided with a quadrature error detector wherein the magnitude of the quadrature error signal is used to control the gain or sensitivity of the monopulse receiver.

3,599,209

PHOTOSENSITIVE ARRAY CORRELATOR

Hunter C. Goodrich, Collingswood, N.J., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 8, 1969, Ser. No. 864,722
Int. Cl. G01s *9/44*
U.S. Cl. 343—9 **6 Claims**



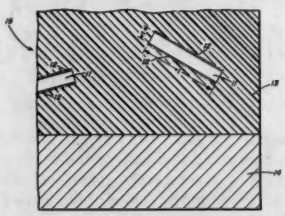
A photosensitive array correlator having a linear array of light sensitive elements positionable over the single line scan of a cathode ray tube indicator of a doppler radar receiver in combination with a pseudorandom code generator driving a doppler transmitter and a code propagation shift register with the shift register outputs coupled to provide bipolar supply voltages on a stage-by-stage basis to the array of light sensitive elements, and with the outputs of the light sensitive elements being coupled to a resistance matrix to produce summed voltages of light sensitive elements for analog output of any target range and of velocity measurement. By this construction several target signals can be processed in parallel, *n*th time around range ambiguities are substantially eliminated, the operation of the system provides results equivalent to pulse compression to provide high range resolution, and the target signals are hard to jam.

3,599,210

RADAR ABSORPTIVE COATING

Maxwell Stander, Silver Springs, Md., assignor to The United States of America as represented by the Secretary of the Navy

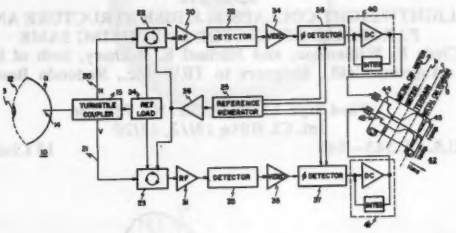
Filed Nov. 18, 1969, Ser. No. 877,722
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 A **4 Claims**



A radar absorptive coating for immunizing conductive surfaces to radar detection comprising conductive fibers cut to a length of one-half wavelength of the anticipated radar frequency and insulated along their lengths. The fibers are randomly distributed in a lossy dielectric resinous binder material bonded to an aircraft or missile. When radar signals impinge on the coating, the fibers act as tuned resonating

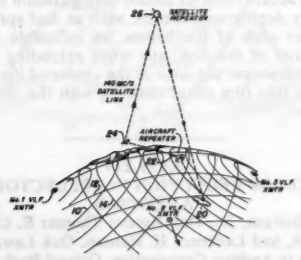
dipoles for the radar frequency used, and the electromagnetic energy will be dissipated in the lossy material, preventing detection of the conductive surface by the radar.

3,599,211
RADIOMETRY SYSTEM
Austin Mardon, Santa Barbara, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Dec. 16, 1968, Ser. No. 785,063
Int. Cl. G01j 5/10; G01k 11/00
U.S. Cl. 343—100 2 Claims



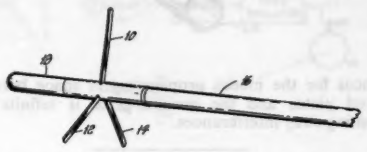
This disclosure relates to a system for detecting metal in a background of terrain or water. It employs a radiometric receiver with input port means directed toward the area to be examined and responsive to thermal emission in two planes of polarization. The system includes means for displaying or comparing the relative emission temperatures in the two planes as an indication of the presence or absence of metal. Fundamentally, the system supresses false alarms due to water.

3,599,212
VERY LOW FREQUENCY TACTICAL COMMAND SYSTEM
John E. Bickel, San Diego; Clemens H. Freres, San Diego; Earl E. Gossard, Del Mar; James E. Britt, San Diego; Norman R. Ortwein, San Diego, and Eric R. Swanson, San Diego, all of, Calif., assignors to The United States of America as represented by the Secretary of the Navy
Filed Apr. 29, 1969, Ser. No. 823,238
Int. Cl. G01s 1/32
U.S. Cl. 343—105 R 3 Claims



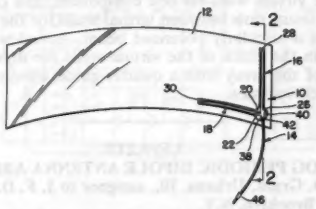
To display at a command post the positions of all vehicles in a tactical area, each vehicle receives three VLF's of an "Omega" grid of hyperbolic lines and retransmits the phase information thereof via an HF link to the command post.

3,599,213
FLEXIBLE BOUYANT CABLE ANTENNA
Dennis E. Fessenden, Niantic; Michael A. Tucchio, Mystic, and Luason L. Carnaghan, Norwich, all of, Conn., assignors to The United States of America as represented by the Secretary of the Navy
Filed Oct. 10, 1969, Ser. No. 866,435
Int. Cl. H01q 1/34
U.S. Cl. 343—710 4 Claims



A spoke-wheel foldable, buoyant antenna comprising three-spokes separated by 120°, the spokes being held on a threaded rod between spacers and the assembly being tightened by a nut. The central conductor of a coaxial cable having a dielectric sheath, a conductive braiding sheath and a buoyant outer sheath is bared and soldered to the connecting means. A short length of cable is similarly added to the connecting means at its other end as a stabilizing tail. Thermoplastic water-resistant material is then molded over the exposed parts to form a sheath having substantially the same diameter as the cable and tail. Thermoplastic water-impermeable, insulative material is then molded around each spoke and a portion of the braiding is left outside the cable to make electrical contact with the sea water environment. The spokes are made of spring-steel tape so that they can be folded down over the cable or the tail.

3,599,214
AUTOMOBILE WINDSHIELD ANTENNA
John Altmayer, Euclid, Ohio, assignor to New-Tronics Corporation, Brook Park, Ohio
Filed Mar. 10, 1969, Ser. No. 805,517
Int. Cl. H01q 1/32
U.S. Cl. 343—713 12 Claims



A nondirectional automobile receiver antenna which may be utilized on either the low frequency broadcast band or the very high frequency, frequency-modulated (FM) band, and which is adapted to be adhesively attached to or embedded within the windshield of an automobile.

3,599,215
LEAKY WAVEGUIDE-ANTENNA COMBINATION
Kenichi Yoshida, Sakai, and Hiroshi Kitani, Takatsuki, both of, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed June 6, 1969, Ser. No. 831,093
Claims priority, application Japan, June 11, 1968, 43/40172
Int. Cl. H01q 13/10, 13/22
U.S. Cl. 343—767 3 Claims

A leaky waveguide-antenna combination employing a leaky waveguide having a coextending ground plate attached thereto and an elongated antenna positioned in parallel over the leaky coaxial cable to receive waves therefrom. Metallic plates extend from both sides of the antenna in parallel to the

ground plate and are provided with parallel grooves which extend longitudinally and have a depth of about one-fourth the cutoff wavelength of the antenna so that the input im-

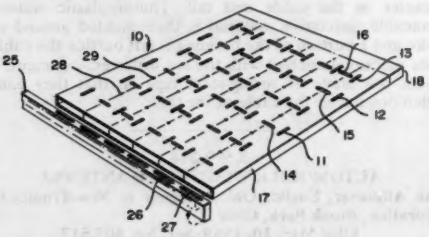
pedances for the modes propagating in space between the grooved plates and the ground plate is infinite thereby preventing stray interferences.

3,599,216

VIRTUAL-WALL SLOT CIRCULARLY POLARIZED PLANAR ARRAY ANTENNA

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, Arthur F. Seaton, Palos Verdes Estates, Calif.

Filed Aug. 11, 1969, Ser. No. 848,810
Int. Cl. H01q *13/10*
U.S. Cl. 343—771 **22 Claims**



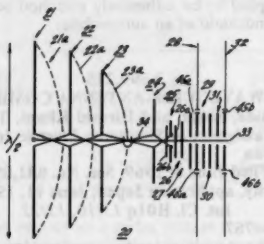
A circularly polarized planar array antenna is provided by a multimode waveguide with alternately displaced transverse slots over virtual walls for one component, and conventional series or shunt slots between virtual walls for the other component of a circularly polarized beam. Actual walls may be inserted in the place of the virtual walls for unbalanced excitation of the array with a quarter-guide wavelength choke under each wall slot.

3,599,217

LOG PERIODIC DIPOLE ANTENNA ARRAY

Ronald D. Grant, Urbana, Ill., assignor to J. F. D. Electronics Corp., Brooklyn, N.Y.

Filed Aug. 19, 1968, Ser. No. 753,590
Int. Cl. H01q *11/10*
U.S. Cl. 343—792.5 **14 Claims**



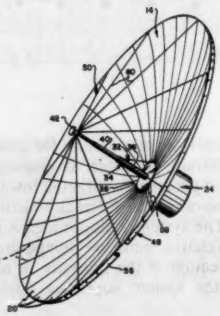
An antenna preferably designed in accordance with log-periodic principles having a superior radiation pattern and an excellent front-to-back ratio to provide exceptional performance in fringe areas. The antenna employs straight dipole arms and for VHF operation is comprised of a forward and rearward active region. The rearward active region is comprised of a plurality of dipoles having electrical lengths selected to operate in the $\lambda/2$ mode for low band VHF reception. The forward active region is comprised of dipoles selected to operate in the $\lambda/2$ mode for high band VHF reception. During low band VHF operation the forward active region has an insignificant effect upon the rearward active region enabling signals in the low band VHF to be of high gain and having a good front-to-back ratio, as well as providing excellent directional characteristics.

3,599,218

LIGHTWEIGHT COLLAPSIBLE DISH STRUCTURE AND PARABOLIC REFLECTOR EMBODYING SAME

Clyde E. Williamson, and Michael E. Bochory, both of Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sept. 11, 1968, Ser. No. 759,136
Int. Cl. H01q *19/12, 15/20*
U.S. Cl. 343—840 **13 Claims**



A collapsible lightweight, dish-shaped structure is provided for use as a parabolic reflector and other uses. The structure has a dish constructed of a lightweight, thin film membrane, such as an aluminized polymeric plastic film selected from the class including Mylar and Kapton. Lightweight elastic ribs or beams, which are preferably slender tubes constructed of the same thin film material as the dish, are bonded to the rear surface of the dish and are preformed to cause the dish to normally assume a predetermined geometric configuration, such as a parabolic shape. The structure may be folded for stowage in a container, or the like, in such a way that the structure, when released from the container, is deployed to its predetermined configuration by the elastic strain energy stored in the folded beams of the structure. Deployment of the dish structure from its folded configuration may be aided by auxiliary deployment means, such as leaf springs secured to the inner ends of the beams, an inflatable ring secured about the rim of the dish, guy wires extending between the rim and a telescopic actuator at the center of the dish, and/or a separable thin film cover defining with the dish an inflatable chamber.

3,599,219

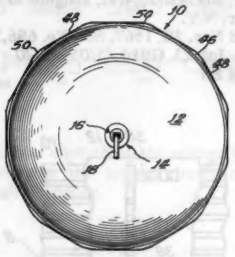
BACKLOBE REDUCTION IN REFLECTOR-TYPE ANTENNAS

Alfred G. Holtum, Jr., Oak Forest; Thomas E. Charlton, Orland Park, and Laurence H. Hansen, Oak Lawn, all of, Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed Jan. 29, 1969, Ser. No. 794,857
Int. Cl. H01q *19/12*
U.S. Cl. 343—840 **18 Claims**

The axial backlobe of a circular parabolic antenna dish is greatly reduced by providing variation of the phase of radiation diffracted at successive portions of the edge. The phase is varied by providing an edge configuration in which successive portions of the edge are at differing distances from the

feed. A dual-polarized antenna employs a polygonal rim surrounding the round reflector. A large increase in front-to-back ratio is obtained. The theory of operation is described to enable use in other structures.

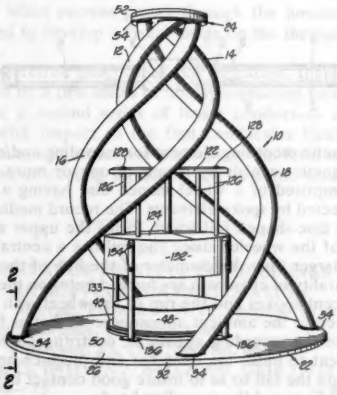


3,599,220

CONICAL SPIRAL LOOP ANTENNA

Richard C. Dempsey, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 24, 1968, Ser. No. 770,340
Int. Cl. H01q 1/36
U.S. Cl. 343—845 8 Claims



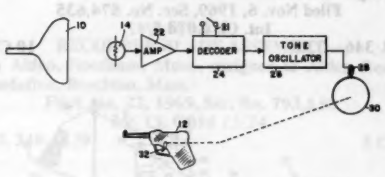
The invention relates to an antenna having a plurality of pairs of spirally wound radiating arms. The radiating arms are wound in the shape of a cone and terminate at one end in a truncated portion. Impedance matching means are provided between each of the pairs of radiating arms at the truncated end. A ground plane is provided for each frequency of operation.

3,599,221

RECORDING CRT LIGHT GUN AND METHOD

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 18, 1968, Ser. No. 713,954
Int. Cl. G01d 5/26; H04n 5/76
U.S. Cl. 346—1 16 Claims



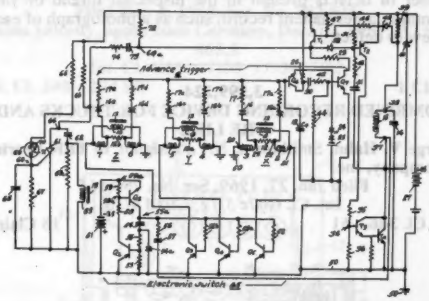
Apparatus and method for recording a coded pattern on a CRT display comprises a detector for detecting the coded pattern, a decoder for recognizing the coded pattern, apparatus for generating a signal in response to a decode, and apparatus for recording the generated signal in a nondeceptive manner by recording the decode immediately subsequent the occurrence thereof. Alternatively, a signal is generated in response to a detected signal and recorded directly without decoding.

3,599,222

VELOCITY SHOCK RECORDER

David M. Franklin, Lexington, and Clive L. Nickerson, Ashland, both of, Mass., assignors to The United States of America as represented by the Secretary of the Army

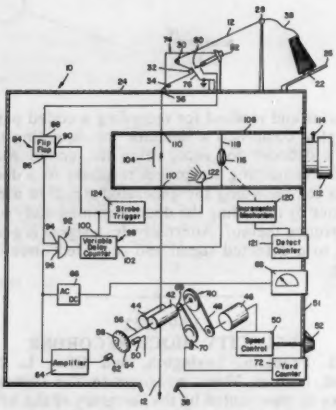
Filed May 15, 1970, Ser. No. 37,644
Int. Cl. G01p 15/08; G11b 5/00
U.S. Cl. 346—7 4 Claims



A velocity shock recorder is described which is capable of measuring and recording shock environments, in terms of impact velocity or drop height, to which containers are subjected to in shipment, handling and storage. A basic magnetic tape recorder is employed within the container wherein are affixed to the inside walls thereof electromagnetic transducers coupled to the magnetic recording heads of said recorder. At impact a voltage proportional to the impact velocity is generated by a related electromagnetic transducer and is coupled to a magnetic recording head which in response thereto causes a signal to be recorded on the tape while it is stationary. This generated voltage is also coupled to a transistor actuating circuit which in response thereto causes a series of transistor switches to be biased into conduction whereupon a path is provided for a capacitor power supply to discharge through the stepping motor of said recorder whereby the magnetic tape is advanced and whereby through such action a negative voltage step is obtained. A transistor switch means is set into operation in response to the negative step voltage associated with operation of the stepping motor and functions to cutoff the aforementioned voltage on the initial positive cycle at a value slightly beyond the maximum value and also prevents activa-

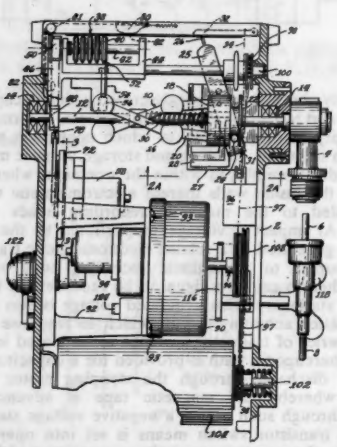
tion of the magnetic recording heads by secondary signals for a period of two seconds.

3,599,223
PHOTOGRAPHIC DEFECT RECORDER
Edwin R. Bridenbaugh, and Lawrence W. Sherman, both of Huntsville, Ala., assignors to Automation Industries, Inc., Los Angeles, Calif.
Filed Nov. 6, 1969, Ser. No. 874,635
Int. Cl. G01d *9/42*
U.S. Cl. 346—33 F **10 Claims**



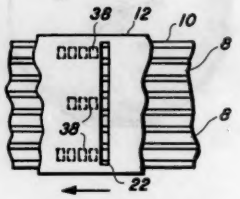
A machine is disclosed herein for rapidly inspecting threads and/or yarns for defects, such as slubs, neps, doubles and/or knots, etc. The machine automatically counts the total number of yards of thread or yarn inspected, the total number of defects present in the inspected thread or yarn and makes a permanent record, such as a photograph of each and every defect.

3,599,224
COMBINED RECORDING DEVICE FOR TRUCKS AND THE LIKE
George V. Hahn, Smithtown, N.Y., assignor to TEK Bearing Company, Inc.
Filed Jan. 27, 1969, Ser. No. 794,165
Int. Cl. G07c *5/12;* **G01d** *9/30*
U.S. Cl. 346—61 **18 Claims**



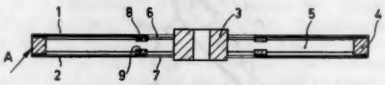
A compact, primarily automatic recording device for use on trucks, particularly those involved in interstate commerce, for recording time, speed and related matters and other selected conditions in a permanent tamperproof manner to thereby furnish detailed records for truck fleet operator's use or Interstate Commerce Commission use.

3,599,225
ELECTROSTATIC RECORDING APPARATUS
William Babaoff, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Nov. 28, 1967, Ser. No. 686,238
Int. Cl. G01d *15/06, 15/20*
U.S. Cl. 346—74 ES **6 Claims**



An electrostatic recording apparatus wherein a corona source including a plurality of equidistant conductors are selectively pulsed to generate a corona stream in a space between a backing electrode and the pulsed conductor, this space being defined by an aperture in a dielectric member which moves the aperture in a direction substantially parallel to said conductors.

3,599,226
MAGNETIC RECORD ELEMENT
Theodoor Maria Albert Lips, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1969, Ser. No. 812,804
Claims priority, application Netherlands, Apr. 27, 1968, 6,806,033
Int. Cl. G01d *15/12, 15/34;* **G11b** *25/04*
U.S. Cl. 346—74 MD **5 Claims**

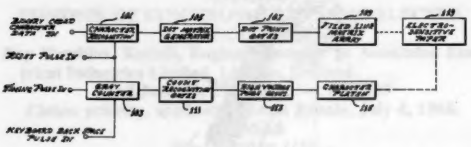


A magnetic recording element for recording and/or playing back magnetic records by means of one or more magnetic heads comprised of a wheel-shaped disc having a hub and rim connected by spoke elements. The record medium is carried on a disc-shaped foil which forms the upper and lower surfaces of the wheeled disc. The foil has a central opening which is larger than the diameter of the hub of the wheel so that a plurality of chambers are formed between the foils, the two adjacent spokes and the rim of the wheel with the inner end opened to the ambient atmosphere so that as the disc is rotated on the recording apparatus, centrifugal force causes the ambient to enter the chamber and produce an outward pressure on the foil so as to insure good contact between the record medium and the recording heads.

3,599,227
ELECTRO-ARC PRINTING SYSTEM
Earl H. Cobb, 4513 Edinburg Drive, Woodbridge, Va.
Filed Nov. 19, 1968, Ser. No. 777,009
Int. Cl. G01d *15/06;* **H04l** *15/34*
U.S. Cl. 346—74 ES **3 Claims**

An input typewriter-output printer system where characters originate from either a keyboard or computer and are encoded to binary form to be recognized by an AND gate circuit. The outputs of the AND gates are fed to a matrix generator that activates high-voltage gates to form characters. Each character is parallel fed along a fixed line that is in

alignment with electrosensitive paper upon which the characters are printed by arcing through to a conducting platen divided into segments by insulators, each segment corresponding to one of the parallel characters on the fixed line. A bi-



nary up-down counter controlling the voltage to the segments sequentially completes the arcing circuit of the parallel characters through the paper.

3,599,228

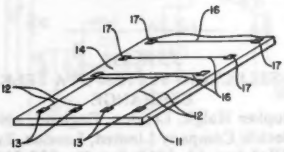
THERMAL RECORDER

Charles E. Coco, Temple, and Stanley M. Welsh, Reading, both of, Pa., assignors to Wyomissing Corporation

Filed Feb. 4, 1969, Ser. No. 796,434

Int. Cl. G01d *15/10*

U.S. Cl. 346—76 **5 Claims**



A system is provided to convert electrically coded intelligence into a visual display of such intelligence. In a preferred form of the invention, a sheet of material carrying a thermally responsive coating material is provided with a plurality of closely spaced electrical junctions. The junctions include a resistive component that causes heat to be generated when current passes through the junctions. This heat is used to develop a visual image on the thermally reactive paper.

In the preferred practice of this invention, the junctions are defined by a first series of linear conductors located in a first plane, a second series of linear conductors angularly disposed with respect to the first conductors located in a second plane, and a resistive element in the form of a continuous film or coating separating the first and second conductors.

3,599,229

APPARATUS FOR PRINTING IN CODED INKS AND RETRIEVING THE INFORMATION

Charles N. Merrell, Plainview, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 23, 1967, Ser. No. 662,657

Int. Cl. B41f *31/02*; **B41j** *27/00*; **G01d** *15/18*

U.S. Cl. 346—75 **6 Claims**

Messages in coded inks in which the code is the presence or absence of photoluminescent components are effected by imprinting in spatially separated marking areas equal in number to the components, moving the marking areas one space and imprinting the coding components for a second symbol. As a result, no marking area will receive the same coded component corresponding to more than one symbol and some marking areas will receive coding components corresponding to more than one symbol. Retrieval is by ultraviolet illumination, photoluminescence of the components being received by separate detectors and the signals read out as symbols.

3,599,230

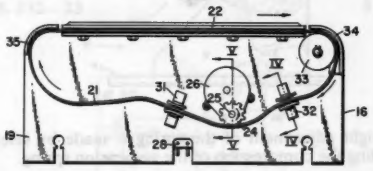
RECORDER BLADE ASSEMBLY

Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Jan. 22, 1969, Ser. No. 793,130

Int. Cl. G01d *15/24*

U.S. Cl. 346—139 **5 Claims**



This invention relates to a recorder blade assembly and, more particularly, to a recording apparatus wherein a movable electrode is provided in the form of a loop and is continuously driven for movement in a straight line through the recording area.

3,599,231

CONSTANT VALUE STORER

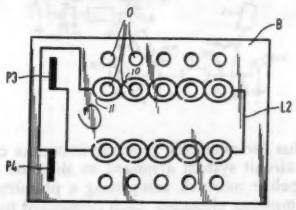
Gunther Rapp, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 4, 1968, Ser. No. 782,515

Claims priority, application Germany, Dec. 12, 1967, P 15 49 065.0

Int. Cl. G11c *17/00*, *11/04*, *7/02*

U.S. Cl. 340—174 SP **1 Claim**



Structures forming transformer read-only storers so as to substantially eliminate capacitive coupling between adjacent layers of stacked storers so as to substantially eliminate incorrect output signals from the storer. Alternate storage planes are formed with input leads transposed so as to substantially eliminate capacitive coupling.

3,599,232

VEHICLE SEAT SUSPENSION SYSTEM

Paul C. Tabor, Roseville, Mich., assignor to Freedman Seating Co., Evanston, Ill.

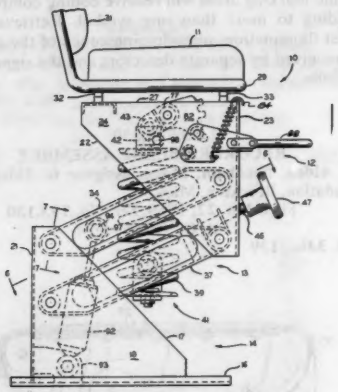
Filed Apr. 28, 1969, Ser. No. 819,576

Int. Cl. B60n *1/02*

U.S. Cl. 248—399 **15 Claims**

Improved suspended vehicle seat having a suspension system comprising means to enable a vehicle operator to adjust the riding height of the seat and to maintain the seat suspension rate while driving. In one embodiment, the suspension rate is adjusted by varying the angle of a seat

suspension spring by means of a positionable rail-riding bracket having one end of the spring associated therewith.



The height adjustment of the spring is made by selectively preloading the compression of the suspension spring.

3,599,233

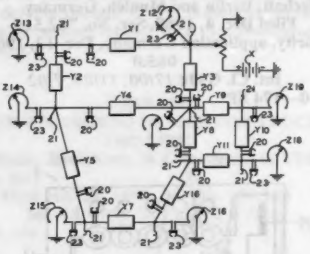
APPARATUS FOR ANALYZING PIPELINE NETWORKS AND COMPUTING ELEMENTS THEREFOR

Richard W. Meyer, 2626 Letchworth Parkway, Toledo, Ohio

Continuation of application Ser. No. 462,770, Mar. 15, 1965, now abandoned , which is a continuation of application Ser. No. 16,042, Mar. 18, 1960, now abandoned. This application Jan. 12, 1970, Ser. No. 1,959

Int. Cl. G06g *7/50*

U.S. Cl. 235—151.34 **18 Claims**



An apparatus for analyzing pipeline networks comprising an electrical circuit system arranged to simulate pipes and loads in a pipeline network comprising a plurality of interconnected computing elements, each connected to represent a pipe, a source of applied voltage connected to the electrical circuit system at a point where a source of pressure is connected to the pipeline network, and variable resistors connected to represent the loads in the system, such that varying voltage drops will occur across the computing elements as the applied voltage varies. Each computing element simulates the variation in fluid flow through a fluid conduit with variation in fluid pressure drop across the conduit over a predetermined range of pressure variation.

3,599,234

RECEPTACLE FOR MODULAR CIRCUIT ELEMENT

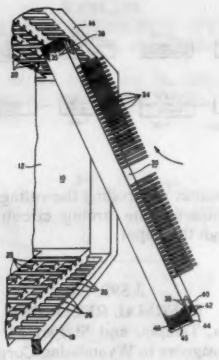
John Andreini, Irvington, N.J.; Edwin Harley Borchard, Boulder; Karl-Heinz Pohl, Boulder, Colo., and Joseph Anthony Puccio, East Brunswick, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 22, 1970, Ser. No. 4,912

Int. Cl. H02b *1/02*

U.S. Cl. 317—101 DH **10 Claims**

The receptacle includes spaced sides having opposed grooves, each side having a plurality of spaced parallel struts extending rearward of the grooves. The grooves accommodate the lateral edges of a circuit board and guide the circuit board into engagement with a connector extending between the sides. Each end of the connector has a pair of



tines that are accommodated by the spaces between the struts, and the tines at one end of the connector include lips that extend behind the struts and secure the connector in place.

3,599,235

ROUTE SELECTING SYSTEM IN A TELEPHONE EXCHANGE

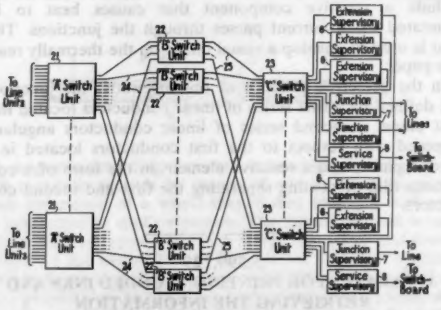
David Christopher Haigh, London, England, assignor to The General Electric Company Limited, London, England

Filed Apr. 11, 1968, Ser. No. 720,513

Claims priority, application Great Britain, Apr. 12, 1967, 16,883/67

Int. Cl. H04q *3/56*

U.S. Cl. 179—18 **5 Claims**



A telephone switching system, for example a P.A.B.X., has tandem-connected A, B and C switching stages connected between input speech paths and supervisory units of a plurality of different types which types are utilized for different types of call through the system. Each switching stage consists of a plurality of full-availability reed relay switch units. There is only a single A–B link between each A switch unit and each B switch unit and a single B–C link between each B switch unit and each C switch unit. Selection of a free route through the switching stages between an input path and a free supervisory unit of a particular type to which the path is to be connected is effected by selecting each C switch unit in turn and examining the pairs of links from each B switch unit to the A switch unit to which the line is connected and to the selected C switch unit to ascertain if there is a free route to that C switch unit. When a suitable C switch unit is found, the pairs of links terminating on the individual B switch units

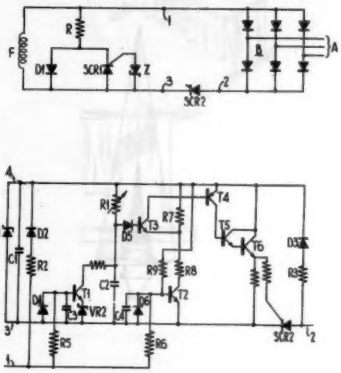
are examined in turn to find a suitable B switch unit. Finally, a free supervisory unit connected to the selected C switch unit is chosen and the required connection through the three stages can then be established.

3,599,236

CONTROL OF SYNCHRONOUS DYNAMO-ELECTRIC MACHINES

Roy Hutchins, Redhill, England, assignor to Associated Electrical Industries Limited, London, England

Filed June 30, 1969, Ser. No. 837,859
Claims priority, application Great Britain, July 4, 1968, 32,050/68
Int. Cl. H02p *1/50*
U.S. Cl. 318—176 **3 Claims**



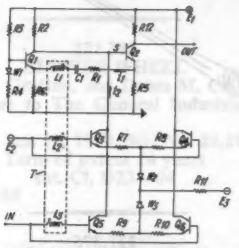
An electronic circuit arrangement for connecting the DC excitation to a synchronous machine near the beginning of a positive half-cycle of its slip-frequency voltage when the speed is found to be sufficient by timing the preceding negative half-cycle. Resistance-capacitance timing means energized by an auxiliary voltage source and reset by a transistor switched on by the positive half-cycles. Transistor trigger means switched on by a combination of positive slip-frequency voltage (or the auxiliary voltage if the machine has already pulled into synchronism) and sufficient voltage from the timing means. A brushless machine construction employs solid-state devices including an SCR switch fired by the circuit arrangement.

3,599,237

MODULATOR AND FREQUENCY MODULATED PHASE-SHIFT OSCILLATOR ARRANGEMENT

Jean Victor Martens, Deurne-Zuid, Switzerland, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 18, 1968, Ser. No. 776,474
Claims priority, application Belgium, Dec. 27, 1967, 47,535
Int. Cl. H03c *3/00*
U.S. Cl. 332—23 **9 Claims**

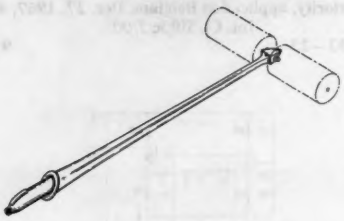


A circuit arrangement is provided having first and second signal transducing circuits with parallel outputs, a first input signal is applied to the inputs of both of said circuits and a second input signal is applied at least to one of said circuits, whereby said second input signal is applied at least to said input of said first circuit where it is superposed to said first input signal.

DESIGNS

AUGUST 10, 1971

221,374
MOTOR, HANDLE AND MOUNTING UNIT FOR ROTATABLE BRUSHES
Ralph H. La Bossier, 27915 10th Ave. S., Auburn, Wash. 98002
Filed Dec. 23, 1969, Ser. No. 20,615
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38

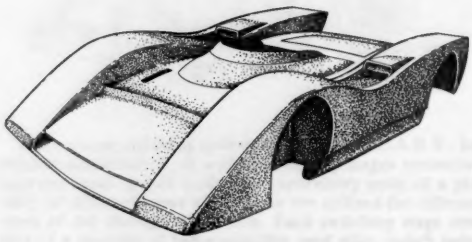


221,375
COMBINATION LOCK FOR BICYCLES OR THE LIKE
Hisashi Saito, Nagoya, Japan, assignor to Kabushiki Kaisha Saikosha Seikakusho, Kasugai, Aichi Prefecture, Japan
Filed Feb. 5, 1970, Ser. No. 21,287
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—114

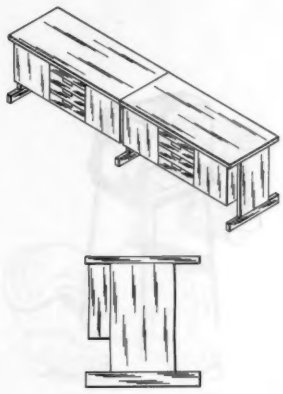
221,376
HELICAL INSERT
John M. Tildesley, Stratford, 93 Wrottesley Road, Tettenhall, Wolverhampton, Staffordshire, England
Filed Dec. 29, 1969, Ser. No. 20,687
Claims priority, application Great Britain July 1, 1969
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—272

221,377
HANDLE FOR A BOTTLE CAP
Joseph F. Schneider, 2326 Sawtella Blvd., Los Angeles, Calif. 90064
Filed Feb. 4, 1970, Ser. No. 21,270
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—266

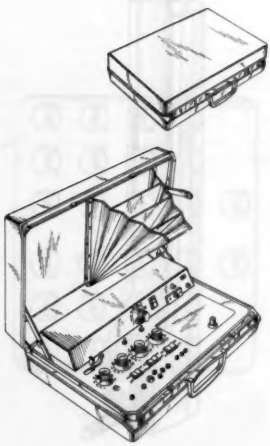
221,378
RACING CAR BODY
Michael D. Williams, Roselle, Ill., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Nov. 10, 1969, Ser. No. 20,025
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



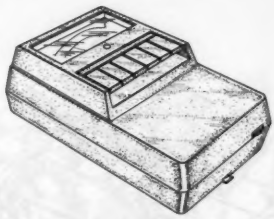
221,379
LABORATORY CABINET
John P. Salsgiver, West Acton, Mass., assignor to United Technical Corporation, West Concord, Mass.
Filed Dec. 18, 1969, Ser. No. 20,561
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D16—2



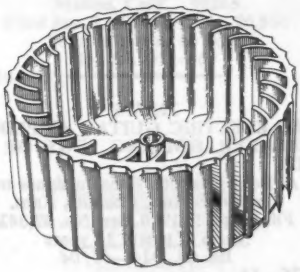
221,380
PORTABLE DENTAL UNIT
Alvin M. Chasen and Alan N. Miller, Spring Valley, N.Y., assignors to Majesco, Inc., New York, N.Y.
Filed Apr. 24, 1970, Ser. No. 22,622
Term of patent 3½ years
Int. Cl. D24—*03;* D3—*01*
U.S. Cl. D24—1



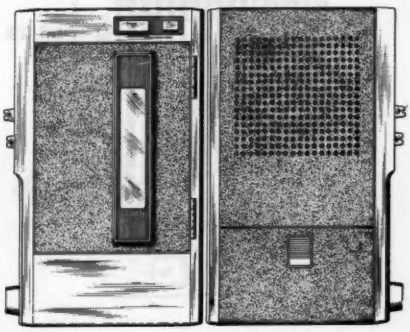
221,381
PORTABLE VOLT-AMMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Mar. 23, 1970, Ser. No. 22,033
Claims priority, application Japan Sept. 29, 1969
Term of patent 7 years
Int. Cl. D10—*10*
U.S. Cl. D26—1



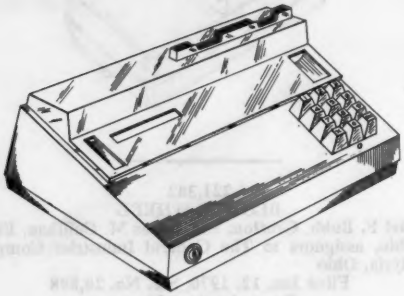
221,382
BLOWER WHEEL
Daniel F. Bubb, Grafton, and James M. Callihan, Elyria, Ohio, assignors to The General Industries Company, Elyria, Ohio
Filed Jan. 12, 1970, Ser. No. 20,898
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165



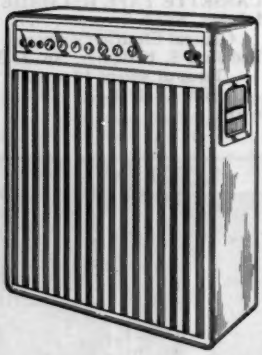
221,383
CASSETTE TAPE RECORDER
John S. Maliskas, North Syracuse, N.Y., assignor to General Electric Company
Filed June 5, 1970, Ser. No. 23,334
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14



221,384
DATA PROCESSING CONTROL UNIT
Thomas A. Molyneaux, Waterford Township, Oakland County, Mich., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Mar. 6, 1970, Ser. No. 21,771
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



221,385
COMBINED ELECTRIC GUITAR AMPLIFIER AND LOUDSPEAKER HOUSING UNIT OR SIMILAR ARTICLE
Charles A. Ross, Chanute, Kans., assignor to Kustom Electronics, Inc., Chanute, Kans.
Filed Apr. 9, 1970, Ser. No. 22,342
Term of patent 14 years
Int. Cl. D14—*01, 04*
U.S. Cl. D26—14

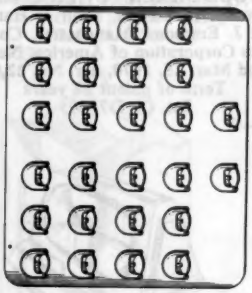


221,386
FOLDABLE VOTING BOOTH
John W. Babbs, Torrance, Arthur H. Krugler, Whittier, and Harry D. Jacoby, Palos Verdes Estates, Calif., assignors to Hitco
Filed Feb. 20, 1970, Ser. No. 21,548
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—7

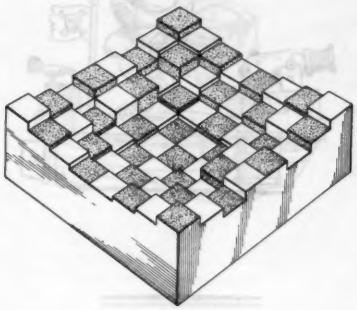
221,387
LIQUID DISPENSER
Louise E. Bacon, North Canton, and Siegfried Garbe, Canton, Ohio, assignors to Spartan International Corporation, Glendale, N.Y.
Filed Nov. 24, 1969, Ser. No. 20,239
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—30

221,388
MOLDED TOY ANIMAL FIGURE
Don A. Winton, Pasadena, Calif., assignor to J. L. Prescott Company, Passaic, N.J.
Filed July 22, 1969, Ser. No. 18,338
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—2

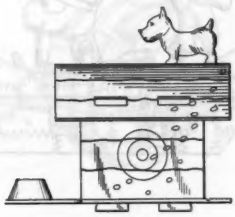
221,389
ORNAMENTAL TEAM STANDING INDICATOR
Lawrence J. Rhea, 4356 Chateau Deville Drive 63129, and William P. Britt, 5032 Kempf Drive 63128, both of St. Louis, Mo.
Filed Mar. 18, 1970, Ser. No. 21,959
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



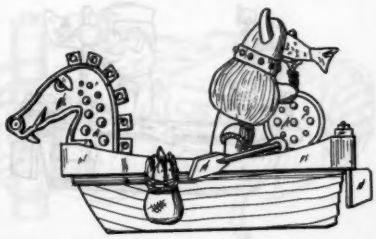
221,390
CHESSBOARD
David R. Skillman, 414 Ridge Road 2, Greenbelt, Md. 20770
Filed July 29, 1970, Ser. No. 24,214
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



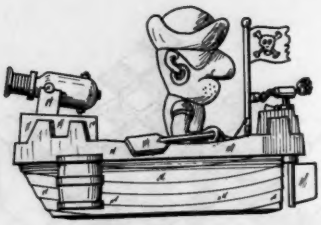
221,391
NOVELTY GLIDER TOY
William Littlejohn, 23425 Malibu Colony Drive, Malibu, Calif. 90265
Filed Jan. 9, 1970, Ser. No. 20,864
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



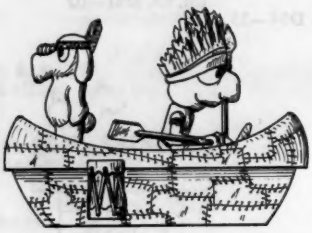
221,392
COMBINED VIKING AND ROWBOAT TOY
John P. McNett, Short Hills, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Feb. 5, 1970, Ser. No. 21,281
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



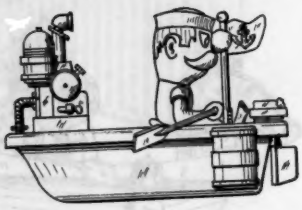
221,393
COMBINED PIRATE AND ROWBOAT TOY
John P. McNett, Short Hills, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Feb. 5, 1970, Ser. No. 21,283
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



221,394
COMBINED INDIAN AND CANOE TOY
John P. McNett, Short Hills, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Feb. 5, 1970, Ser. No. 21,282
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



221,395
COMBINED SAILOR AND ROWBOAT TOY
John P. McNett, Short Hills, N.J., assignor to Remco Industries, Inc., Harrison, N.J.
Filed Feb. 5, 1970, Ser. No. 21,284
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

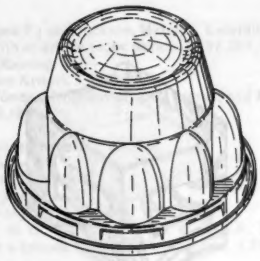


221,396
ACCESSORY FOR TOY TOP OR THE LIKE
Anthony D. Miller, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Mar. 25, 1970, Ser. No. 22,041
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

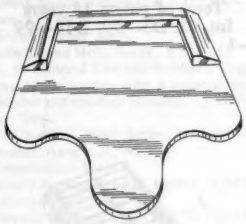
221,397
COOKING UTENSIL
Joyce Chen, 47 Alpine St., Cambridge, Mass. 02138
Filed Mar. 9, 1970, Ser. No. 21,795
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

221,398
FOOD MIXER POWER UNIT
Paul O. Rawson, Jr., Easton, John J. Hamilton, Avon, and Robert J. Emmons, Manchester, Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Mar. 25, 1970, Ser. No. 22,054
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D44—1

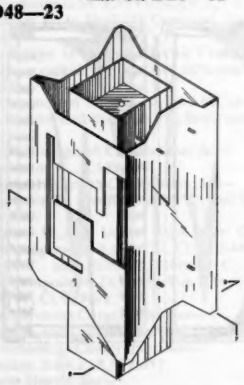
221,399
MOLD FOR A MOUSSE OR THE LIKE
Cyril Alfred Melling, London, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 6, 1970, Ser. No. 22,255
Claims priority, application Great Britain Oct. 9, 1969
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1



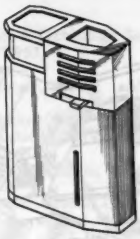
221,400
FLOOR MAT
Thomas P. O'Donnell, Kings County, N.Y. (220 Highland Blvd., Brooklyn, N.Y. 11207)
Filed Oct. 28, 1968, Ser. No. 14,195
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D44—31



221,401
HANGING LAMP
Victor A. Johnson, 5555 Hazel Ave., Philadelphia, Pa. 19143
Filed Oct. 10, 1969, Ser. No. 19,499
Term of patent 7 years
Int. Cl. D26—*02*
U.S. Cl. D48—23

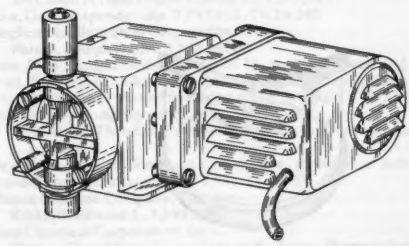


221,402
LIGHTER
Takeo Hayaashi, Tokyo, Japan, assignor to Kabushiki Kaisha Crown Sangyo, Tokyo, Japan
Filed Apr. 3, 1970, Ser. No. 22,241
Claims priority, application Japan Oct. 4, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

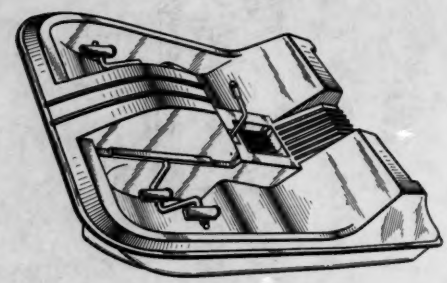


221,403
WATERPROOF CASE FOR A PHOTOGRAPHIC CAMERA
Nobuki Matsumoto, Sadao Okada, Masayuki Sakuma, Ohiko Yagi, and Masatoshi Hideshima, Tokyo, Japan, assignors to Kabushiki-Kaisha Ricoh, Tokyo, Japan
Filed Mar. 31, 1970, Ser. No. 22,138
Claims priority, application Japan Feb. 5, 1970
Term of patent 7 years
Int. Cl. D16—*07*
U.S. Cl. D61—1

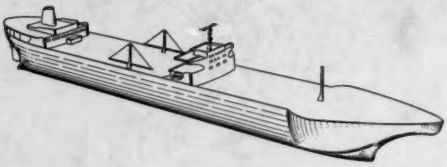
221,404
CHEMICAL FEED PUMP
Norman R. Hussey, Amesbury, Mass., assignor to A & D Fabricating Company, Inc., Lowell, Mass.
Filed Mar. 16, 1970, Ser. No. 21,921
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



221,405
PEDAL BOAT
Fred Schropfer, 509 Champlain St., Fabreville, Quebec, Canada
Filed Apr. 7, 1970, Ser. No. 22,300
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



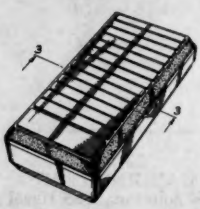
221,406
ICEBREAKING VESSEL
Peter M. Kimon, Cos Cob, Conn., and Charles Lincoln Crane, Jr., Madison, N.J., assignors to Esso Research and Engineering Company
Filed Feb. 9, 1970, Ser. No. 21,327
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1

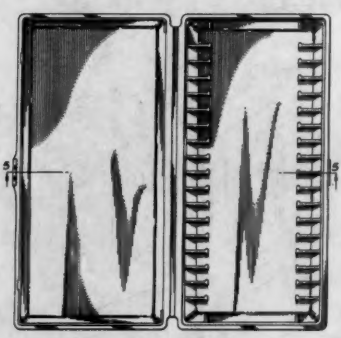


221,407
CERVICAL COLLAR
John L. Bond, P.O. Box 1306, North Wilkesboro, N.C. 28659
Filed Jan. 12, 1970, Ser. No. 20,882
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1

221,408
STORAGE BOX
Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Feb. 13, 1970, Ser. No. 21,429
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1

221,409
STORAGE CONTAINER FOR TAPE CASSETTE
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 10, 1970, Ser. No. 24,387
Term of patent 14 years
Int. Cl. D3—*99*; D14—*99*
U.S. Cl. D87—1





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TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF AUGUST, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaronson, Stephen F.; and Jackson, Harry Y. Laterally movable shuttle assembly with an article probe device. 3,598,265, Cl. 214-730.

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AB Kabi: *See—*
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AB Pulsvarme: *See—*
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AB Turnkey-Projekt: *See—*
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Abbott Laboratories: *See—*
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Abe, Hidehiko: *See—*
Nakajima, Koe; Naoi, Hisashi; Kishikawa, Kanichi; Abe, Hidehiko; and Tanaka, Kazunari,3,597,954.

Abe, Ikuya; Kaga, Akio; and Eoka, Hideo, to Moritake Iron Works Co., Ltd. Filter press. 3,598,240, Cl. 210-230.

A. B. Electronics Components Limited: *See—*
Bridle, Kenneth F., 3,599,173.

Abert, Jack C.; and Farnbach, Fred A., said Farnbach assor. to said Abert. Lightweight tent construction. 3,598,133, Cl. 135-1.

Abex Corporation: *See—*
Convey, Robert W., 3,598,990.

Accumulatorenfabrik Sonnenschein G.m.b.H.: *See—*
Schulz, Jurgen, 3,598,171.

ACF Industries, Incorporated: *See—*
Terlecky, Boris S.; and Holt, Jan D., 3,598,250.

Achon, Marco A., to General Tire and Rubber Company, The. Process for polymerizing cyclic oxides with a catalyst consisting of an organozinc compound and another material. 3,598,765, Cl. 260-2.

Ackermann, Hans: *See—*
Beffa, Fabio; Lienhard, Paul; Seiler, Herbert; Ackermann, Hans; and Wegmuller, Hans E.,3,598,801.

Acme General Corporation: *See—*
Kellems, Kenneth K.; and Brydolf, Robert, 3,597,790.

Acme Products Incorporated: *See—*
Stanfield, Howard E.; Stanfield, Gary W.; and Camp, George F., 3,598,501.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone-forming circuitry including filter and random noise modulation. 3,598,891, Cl. 84-1.24

Adair, John D., to Singer Company, The. Impulse generator for meters. 3,599,022, Cl. 310-75.

Adamation Inc.: *See—*
Weihe, Clyde R. Jr., 3,598,131.

Adams, Irving; and Friedrich, Richard F., to Loral Corporation. Means and method for crucible leak detection. 3,598,532, Cl. 23-230.

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Addamiano, Arrigo, to General Electric Company. Formation of junctions in silicon carbide by selective diffusion of dopants. 3,598,666, Cl. 148-187.

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Addressograph Multigraph Corporation: *See—*
Sejeck, Arthur W., 3,598,457.

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Baltazzi, Evan S.; Shelffo, Loren E.; and Moduthagam, Michael, 3,598,580.

Adelman, John W., to Union Tank Car Company. Safety vent discharge arrangement. 3,598,277, Cl. 220-44.

Adrian, David T.; and Robman, Norman C., to Deutsch Company Electronic Components Division, The. Three-unit electrical connector. 3,599,167, Cl. 339-42.

Advance Data Systems Corporation: *See—*
Dell, Robert; and Crews, John Benjamin, 3,598,964.

Advanced Technology Center, Inc.: *See—*
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Huckstadt, Harald; Saleck, Wilhelm; Randolph, August; and Ranz, Erwin, 3,598,590.
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Ainsworth, Frank W., to Honeywell Inc. Multiplexer control apparatus. 3,598,922, Cl. 179-15.

Air Cargo Equipment Corporation: *See—*
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Airmatic Valve, Inc.: *See—*
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Aizawa, Susumu; and Gomi, Yoshifumi. Driving device of electronic watch. 3,597,915, Cl. 58-23.

Ajinomoto Co., Inc.: *See—*
Toi, Koji; Nakayama, Naoko; Sato, Naotake; Akashi, Takekazu; and Uchiyama, Noboru, 3,598,838.

Akahano, Tatsuro, to Kabushiki Kaisha Suwa Seikosha. Day-of-the week indicating mechanism. 3,597,912, Cl. 58-5.

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Akhtar, Saleem, to Transitron Electronic Corporation. Alkali-free molybdenum sealing hard glass. 3,598,620, Cl. 106-54.

Akister, William Desmond; and Shelley, Meville Leslie, to Redifon Limited. Ground based flight simulating apparatus. 3,597,857, Cl. 35-12.

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Alley, Forrest C., to Westvaco Corporation. Removal of sulfur compounds from gas streams. 3,598,521, Cl. 23-25.

Alliance Machine Company, The: *See—*
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Alza Corporation: *See—*
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Amann, Robert C. Key cast concrete construction system. 3,598,356, Cl. 249-35.

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Amidon, John Leonard: *See—*
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Andersen, Harold W.: *See—*
Andersen, Harold Willids; Andersen, Harold W.; and Harrison, Charles H.,3,597,934.

Andersen, Harold Willids; Andersen, Harold W.; and Harrison, Charles H., to Andersen H. W., Products, Inc. Method and apparatus for supplying measured quantities of a volatile fluid volatile material. 3,597,934, Cl. 62-52.

Andersen, Harold Willids; and Harrison, Charles Harvey, to Andersen, H. W., Products, Inc. Drainage control. 3,598,124, Cl. 128-275.

Andersen, Harry M.; and Calfee, John D., to Monsanto Company. Molding composition. 3,598,693, Cl. 161-170.

Anderson, Arnold E., to Ford Motor Company. Ignition cable connector. 3,599,171, Cl. 339-97.

Anderson, Clarence W., to Sonoco Products Company. Apparatus and method for measuring a component of travel of a axially advancing and rotating tube. 3,597,847, Cl. 33-142.

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Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., to Sandoz-Wander, Inc. 3-Substituted amino-6-hydrazino pyridazines. 3,598,822, Cl. 260-250.

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Andreini, John; Borchard, Edwin Harley; Pohl, Karl-Heinz; and Puccio, Joseph Anthony, to Bell Telephone Laboratories, Incorporated. Receptacle for modular circuit element. 3,599,234, Cl. 317-101.

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Arendt, Hans Fritz; and Magin, Berthold, to Arendt, Hans F. Rotating apparatus for subjecting textile mater- to a shrinkage-reducing treatment. 3,597,851, Cl. 34-60.

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Kovach, Stephen M.; and Kmecak, Ronald A., 3,598,878.

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Beck, Ralph A., to Beloit Corporation. Multiple stage hydraulic headbox. 3,598,696, Cl. 162-298.

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Block, Myron J., to Block Engineering, Inc. Multiple-barrel hand weapon with selective barrel discharge capability. 3,597,870, Cl. 42-42.

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Bodine, Albert G. Method and device for tunnelling. 3,597,929, Cl. 61-42.

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Bofinger, Karl; and Hake, Walter Thomas, to American Can Company. Method for securing strip members to container bodies. 3,598,675, Cl. 156-172.

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Bohn, Stanley W.; and Dimond, William J., to United States of America, Atomic Energy Commission, mesne. Producing stereophotographs with a closed circuit television system. 3,598,032, Cl. 95-18.

Bok, Edward. Drafting pen with dried ink collector. 3,598,494, Cl. 401-259.

Boksjo, Carl Ingvar; and Stackegard, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Overload protector for short-circuiting static converters in response to increases in the direct current. 3,599,076, Cl. 321-14.

Bon, James W., to United States of America, Navy. Rocket assisted projectile-spin static firing stand. 3,597,968, Cl. 73-117.4

Bonnet, Etienne, to Entreprise de Recherches et d'Activites Petrolieres, (ELF). Metering valve for introducing a fluid under pressure into an analytical apparatus. 3,597,979, Cl. 73-422.

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Borg, Arthur C.; and Zajac, Stephen J., to Standard Oil Company (Indiana). High temperature grease. 3,598,734, Cl. 252-28.

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Bouthors, Pierre; and Quemerais, Philippe, to Regie Nationale Usines Renault, and Automobiles Peugeot. Friction-ring variable-speed transmission mechanisms. 3,597,986, Cl. 74-230.17

Bowen, Jack L.; and Chace, Richard L., to General Electric Company. Miniature square oiltight pushbutton switch. 3,598,948, Cl. 200-159.

Bower, Arnold B., Jr., to General Electric Company. Cutter bits and blocks for mining machines. 3,598,447, Cl. 299-91.

Bowman, George E. Exercising apparatus including pivotally connected weight supporting units. 3,598,404, Cl. 272-57.

Bowman, Jim H.; Bowman, Ralph L.; and Moeller, Keith A. Livestock dip apparatus. 3,598,088, Cl. 119-158.

Bowman, Ralph L.: *See—*
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Boyko, George, to Pinkerton's, Incorporated. Dual alarm, coaxial line resonator, instrusion detection system. 3,599,195, Cl. 340-258.

Boyko, George, to Pinkerton's, Incorporated. Plural chambered, oscillator-coaxial line resonator- detector assembly for moving object detection systems. 3,599,196, Cl. 340-258.

Boyko, George, to Pinkerton's, Incorporated. Electromagnetic moving object detection system utilizing a coaxial line resonator. 3,599,197, Cl. 340-258.

Bradley, William E., Jr.: *See—*
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Brandestini, Antonio; and Siegwart, Hans Rudolf, said Riegwart, Hans R., assor. to Brandestini, Antonio. Wire tensioning apparatus for use in stressing concrete structures. 3,598,368, Cl. 254-29.

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Carol, John A., Jr.; Cardani, Charles S.; and Schoendorff, Arthur J., to General Motors Corporation. Digital speed control system. 3,599,154, Cl. 340-172.5

Carp, Ralph W., to Bendix Corporation, The. Frequency sensitive circuit having output proportional to frequency difference between two inputs. 3,599,014, Cl. 307-233.

Carp, Ralph W.; Howard, William E.; Slavin, Michael; and Ang, Leoncio T., to Bendix Corporation, The. Automobile speed control. 3,599,052, Cl. 317-148.5

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Choate, William C., to Texas Instruments, Incorporated. Feedback minimized optimum fiiters and predictors. 3,599,157, Cl. 340-172.5
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Dressayre, Jean, to U.S. Philips Corporation, mesne. Green extension circuit for traffic control. 3,599,144, Cl. 340-37.

Drexler, Jan; and Havel, Jan, to Ceskoslovenska akademie ved. Apparatus for applying random mechanical loads to a test specimen. 3,597,967, Cl. 73-91.

Drimak, Edward G.: *See—*
Cordero, Humberto, Jr.; Drimak, Edward G.; Hutchinson, Richard J.; Schaughency, Michael F.; and Shimp, Everett M.,3,599,176.

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Dunlop, James. Adjustable capo tasto. 3,598,012, Cl. 84-318.

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Dyre, Eddie L.; and Greacen, John A., to Carrier Corporation. Purge system for lithium bromide absorption water chiller. 3,597,936, Cl. 62-474.

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Ebersohl, Gerard, to Compagnie Generale d'Electricite. On-load electronic control synchronous switching device. 3,599,040, Cl. 317-11.

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Eibes, Carl B. H., deceased0 (by Eibes, Ursula Geb. Waschau0Eibes, Christian0Eibes, Maria-Theresia Geb. Wagner; heirs). Self-tapping threaded bushings. 3,597,781, Cl. 10-10.

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EMI Limited: *See—*
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Feinberg, Irving, to Presto Lock Co., Inc. Latching device and combination locking means. 3,597,945, Cl. 70-74.

Feinberg, Joseph George; Fosker, Alan Philip; and Mill, Patrick James, to Miles Laboratories, Incorporated. Stabilized aluminum hydroxide suspensions. 3,599,150, Cl. 424-88.

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Fischer, Artur. Toy construction kit. 3,597,873, Cl. 46-16.

Fischer, James L.; Hays, Carroll D.; and Klier, Richard G., to Bell Telephone Laboratories, Incorporated. Coin telephone facility for combined use by general public and physically handicapped. 3,598,920, Cl. 179-6.3

Fischer, Walter A., Jr.; Coultas, Robert; and Nichols, Arthur, to Dumont Oscilloscope Laboratories, Inc. Controlled display of waveforms. 3,599,034, Cl. 315-26.

Fish, Kenneth Elton, to Bevis Industries, Inc. Pin rack for tenter chain link. 3,597,815, Cl. 26-62.

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Fisher, Carl Manning. Bucket attachment for front end loaders. 3,598,266, Cl. 214-767.

Fisher, Gene A., to International Business Machines Corporation. Optical graduated rule of transparent material. 3,598,493, Cl. 356-152.

Fitzpatrick, Vincent F.; Richman, Russell B.; and Divine, James R., to United States of America, Interior, mesne. Apparatus for detecting and measuring crevice corrosion. 3,599,090, Cl. 324-71.

Flais, Louis R., to Bailey Meter Company. Electrochemical oxygen analyzer. 3,598,711, Cl. 204-195.

Flanagan, Robert M.; and Johnson, Glenn W., Jr., to Amerace Esna Corporation. Timing device with pneumatic delay means. 3,599,131, Cl. 335-61.

Fleischer, Oscar. Level wind guide attachment for fishing reels. 3,598,334, Cl. 242-84.41

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Fountain, Eugene B.; and Ambwani, Durga S., to Shell Oil Company. Cyclodiolefin hydrogenation. 3,598,877, Cl. 260-666.

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Fruth, Jonathan N., to General Motors Corporation. Control mechanism for simultaneously controlling operation of fluid and electrically operated devices. 3,599,128, Cl. 335-1.

Fryar, Paul J. Clinical temperature bandage. 3,597,976, Cl. 73-358.

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Fujimori, Motoyuki, to Kabushiki Kaisha Suwa Seikosha. Battery carrying means for electric or electronic timepiece. 3,597,913, Cl. 58-23.

Fujino, Masahiko; and Hatanaka, Chitoshi, to Takeda Chemical Industries, Ltd. t-Alkyl pentachlorophenyl carbonate. 3,598,856, Cl. 260-463.

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Nauta, Robin G. F., to Dorr-Oliver Incorporated. Fluidized bed reactor. 3,598,375, Cl. 263-21.

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Nelson, Averd G. Pinch-on fishing sinker applier and assembly. 3,597,823, Cl. 29-200.

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Young, Arnold E.; and Little, John C., to Dow Chemical Company, The. Method of preparing N-substituted 1,4,5,6-tetra- hydro-6-oxo-3-pyridazine carboxylic acids. 3,598,821, Cl. 260-250.

Young, Gerald H., to Westvaco Corporation. Pallet structure with self locking leg. 3,598,065, Cl. 108-53.

Yudelson, Joseph S.; and Dernbach, Barbara F., to Eastman Kodak Company. Photographic physical developers. 3,598,587, Cl. 96-48.

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Zaffaroni, Alejandro, to ALZA Corporation. Bandage for administering drugs. 3,598,123, Cl. 128-268.

Zaginailoff, Ralph G., to Avco Corporation. Fluidic infrared sensing device. 3,598,136, Cl. 137-81.5

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Zinda, Norman P., 1/2 to Head, Robert E. Cleaning device. 3,597,785, Cl. 15-1.5

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Zucker, Daniel, to Telrad Telecommunication & Electronic Incustries. Line holding circuit for a multi line telephone system. 3,598,924, Cl. 179-99.

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Asper, Jean-Jacques, to Brasco S.A. Continuously and automatically cleaning multicellular filters. Re 27,163, 8–10–71. 210—138.

Barton, Loy E.: *See*—
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Campbell, David S., and E. H. Natschke, to Cardwell Westinghouse Co. Hydraulic cushion. Re 27,159, 8–10–71, Cl. 213—43.

Cardwell Westinghouse Co.: *See*—
Campbell, David S., and Natschke. Re 27,159.

Claiborne, Jefferson L., to Dixie Yarns, Inc. Batch temperature-function program controller. Re 27,167, 8–10–71. Cl. 307—140.

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Ferdinand, Irwin J., and M. E. Handler, to Hirsh Co. Steel shelving. Re 27,160, 8–10–71, Cl. 108—144.

Ferguson, Alan C.: *See*—
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Kehr, Clifton L., and J. L. Guthrie, to W. R. Grace & Co. Crosslinking process. Re 27,158, 8–10–71, Cl. 260—41.5.

Markham, Odell C., and A. C. Ferguson. Parachute protected aircraft. Re 27,162, 8–10–71, Cl. 244—139.

Mattel, Inc.: *See*—
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Natschke, Eldred H.: *See*—
Campbell, David S., and Natschke. Re 27,159.

Nattoli, Le Roi, to Robert H. Hollowell Industries, Inc. Selective card distributing device. Re 27,166, 8–10–71. Cl. 273—149.

Raymon, Raymond T., to Home Guard Control, Inc. Adjustable closure lock. Re 27,161, 8–10–71, Cl. 49—449.

Spanel, Abram N., and L. E. Barton, said Barton assignor to said Spanel. Tufting apparatus for the manufacture of carpets, rugs, and the like. Re 27,165, 8–10–71, Cl. 112—79.

Yeager, Edward H., to Mattel, Inc. Miniature automobile racing game utilizing adhesive connection. Re 27,164, 8–10–71, Cl. 46—243.

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Cobia, Barnell L., to B. L. Cobia, Inc. Milkweed plant family. 3,054, 8–10–71, Cl. 88.

Cocker, Alexander M. Rose plant. 3,056, 8–10–71, Cl. 20.

Guengerich, Harry W., to Stark Bro's Nurseries & Orchards Co. Apple tree. 3,057, 8–10–71, Cl. 34.

Guengerich, Harry W., to Stark Bro's Nurseries & Orchards Co. Apple tree. 3,058, 8–10–71, Cl. 34.

Guengerich, Harry W., to Stark Bro's Nurseries & Orchard Co. Apple tree. 3,061, 8–10–71, Cl. 34.

Hyde, Robert W. Rose plant. 3,055, 8–10–71, Cl. 11.

McDaniel, Gayle K., to Carlton Rose Nurseries. Rose plant. 3,059, 8–10–71, Cl. 21.

Schmidt, Daniel P., deceased, by J. E. Schmidt. Maple tree. 3,060, 8–10–71, Cl. 51.

Schmidt, Jane E.: *See*—
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Bacon, Louis E., and S. Garbe, to Spartan International Corp. Liquid dispenser. 221,387, 8–10–71, Cl. D33—30.

Bond, John L. Cervical collar. 221,407, 8–10–71, Cl. D83—1.

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Bubb, Daniel F., and J. M. Callihan, to The General Industries Co. Blower wheel. 221,382, 8–10–71, Cl. D23—165.

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La Bossier, Ralph H. Motor, handle and mounting unit for rotatable brushes. 221,374, 8–10–71, Cl. D4—38.
Lever Brothers Co.: *See*—
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O'Donnell, Thomas P. Floor mat. 221,400, 8–10–71, D44—31.
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56 : 3,598,191
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8 : 221,391

9 : 221,398
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10 : 221,399
17 : 221,378
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20 : 221,385
24 : 221,390
25 : 221,379
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221,404

26 : 221,384
29 : 221,389
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34 : 221,395
36 : 221,380
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221,400
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39 : 221,382
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12 : 3,055
29 : 3,057

29 : 3,058

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